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Economy Features In a Modern Warehouse

Minimum Crane Travel, Special Cradles for Storage, Plate Handling Electromagnets and Network of Driveways for Trucking Are Efficiency Factors

BY H. A. KNIGHT

A WAREHOUSE in Philadelphia for handling iron and steel has been occupied for three years and has therefore been afforded ample time to demonstrate good and bad features. It is the warehouse of Morris, Wheeler & Co., Thirtieth and Locust streets. The building has a total storage space of 140,000 sq. ft., a capacity for 30,000 tons of steel, employs 125 men and owns and operates seven trucks and eight teams of horses.

The warehouse has 400 ft. of wharfage on the Schuylkill River, which empties into the Delaware River, and is served by a siding of the Pennsylvania Railroad, of which there are three spurs. So far, there have been no shipments by water, though this would be possible by deep draught vessels after dredging, as all bridges below are provided with draw spans. At present the water is 8 ft. deep at low tide. The property comprises 4½ acres.

The building is of steel, concrete and brick of the monitor type. At the base is an 8-ft. solid concrete wall with continuous steel sash above. Light and ventilation are secured from pivoted sash runs in the monitors. The warehouse is in two parts, designated as No. 1 and No. 2, the crane runways and monitors of one running at right angles to those of the other. The first is arranged in two bays, each 60 x 315 ft.; the second, into five bays, each 60 x 300 ft.

The outstanding features are: The minimizing of heavy crane travel, the maximum distances being 75 ft. in No. 2 warehouse and 100 ft. in No. 1. (This occurs only for material in the end of the vertical storage racks in the bay farthest from No. 1 track); the cradle system of stacking, which allows for a minimum of storage space with a maximum ease of handling and convenience; the use of the electromagnet with an automatic device for keeping the feed cable taut; the use of dial scales, which eliminates loss of time in adjusting beam scales; the ownership of motor trucks and teams rather than the leasing of trucking service outside; a network of driveways within the property, making for a maximum of ease in handling.

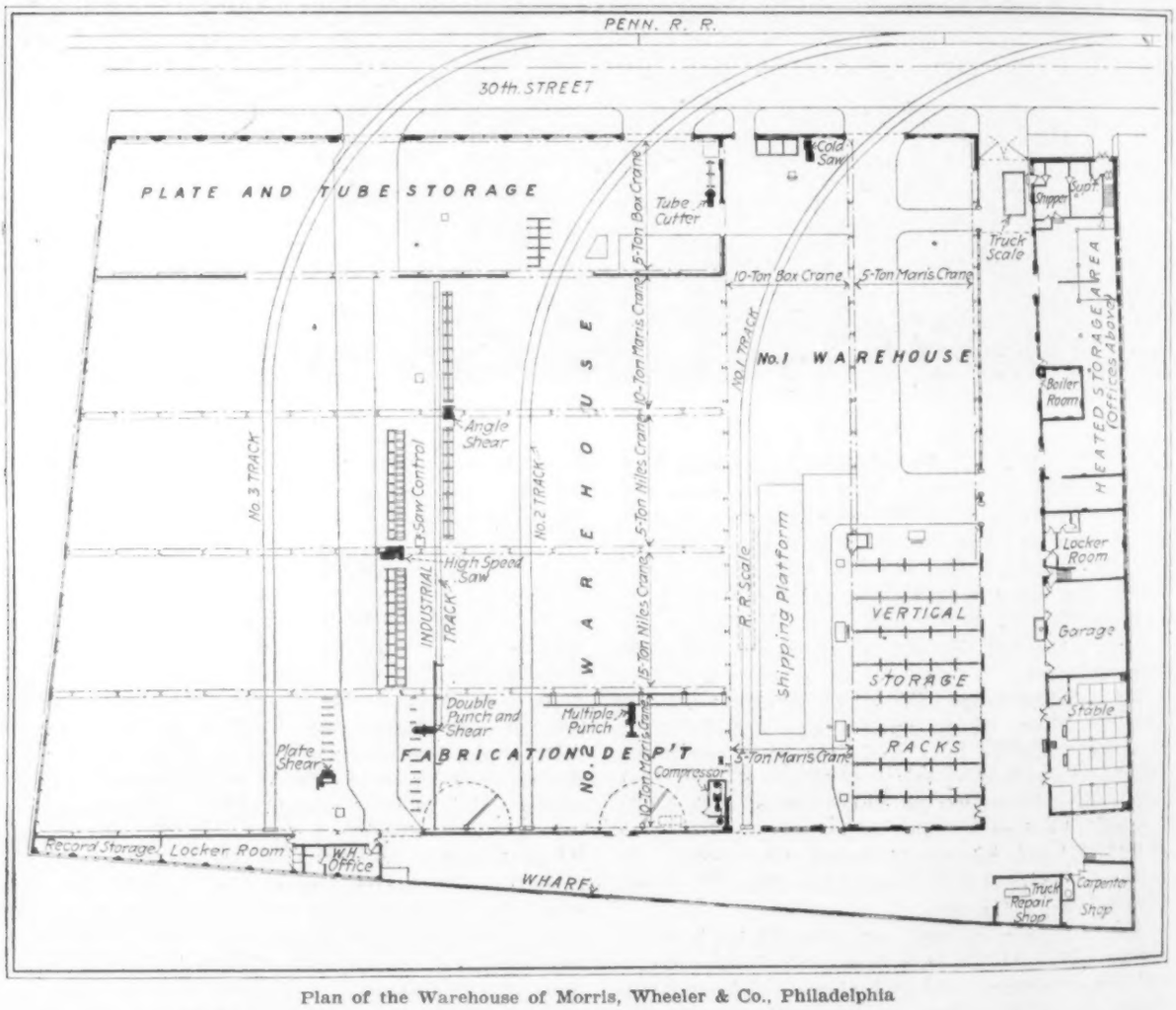
So well pleased is the management with the arrangement and facilities that there are very few changes that they would make. The ideal warehouse would not contain curves in the track inside the building, but in the Morris, Wheeler & Co. building the layout of the land and siding made it necessary that there be a slight curve. If the tracks entered at right angles only a 16-ft. wide steel shutter would be necessary at the entrance; as it is, a 36-ft. one is used. When there are track curves inside, steel pieces which extend over two cars tend to bind at the curve and throw the car off the track or break the car sides; it is more difficult to place in motion a car on a curve. Curves also do away with the desired rectangular spaces for storing.

A. C. Sherman, superintendent of the warehouse, would provide another alley at the end of the vertical bar storage department. This would relieve the congestion of men handling the bars by giving two outlets for stock in storage and would reduce the maximum haulage from 75 ft. to 37½ ft. The position of truck dispatcher, similar to train dispatcher, might be created. He would scientifically route the trucks and keep track of what location in the city each truck occupied at any time. The time spent in loading trucks in the morning is too long. Plans are being made for enlarging the garage. Outside of these changes the management has little to alter.

The management believes that the tendency in modern warehouse practice is to decrease vertical stor-

age in favor of horizontal piling of materials. Accordingly, the company stores vertically only those pieces which can be handled conveniently by one man and those sizes of which only a small stock is carried. This includes rods up to 1¾ in., flats up to ⅝ in. x 4 in., angles up to 2½ x 2½ x 5/16 in., all 20-ft. lengths. The racks are built with a reinforced concrete floor at the same level as the gangways. The management considers them superior to the type of rack built recently in other localities where the base of the racks is in a pit from 2 to 3 ft. deep. While the pit type of construction facilitates the storing of material to some extent, it usually makes necessary the use of two men to get out each bar to be weighed.

The small distance of crane travel from freight car to storage pile is made possible by the convenient placing of the three railroad spurs, each of which allows for seven freight cars on each spur in the warehouse at a time. The eight cranes operate in seven bays, five of which are 300 ft. long and two, 315 ft. in No. 1 warehouse, devoted chiefly to bars of an average of 20 ft. in length, the piles are perpendicular or parallel, which is the more convenient. A reason for the laying out of bays across the tracks in No. 2 warehouse is that in this way both No. 2 and No. 3 sidings pass through each bay and inbound cars on one track can be unloaded at the same time that cars on the other track are loaded. Also in this department different classes of material have their place in definite sections of these bays (all angles being in bay C, for example), so that in or out-bound cars can be placed on either of the two sidings at the location nearest to the destination of the inbound material, or, in the case of outbound shipments, at the point nearest the final position of the material on order, after it has been cut to length and fabricated. This is a big factor in making for the reduction of material travel here to a maximum of 75 ft. and allows work to be done on all classes of stock at the same time. An electric tractor is used as an auxiliary transporting device within the warehouse.



Plan of the Warehouse of Morris, Wheeler & Co., Philadelphia

One of the latter bays is served by two cranes to handle loading and unloading simultaneously. The cranes include: Two Niles, 5-ton and 15-ton; two Box, 5-ton and 10-ton; four Maris, two 5-ton and two 10-ton. The cranes are equipped with double trolleys and hoists for handling material in long lengths. The cranes carry running lights along the bottom of the bridge girder to give proper illumination to "hookers-on," especially when working between high piles of material.

The cars are shifted each night to be in the correct position in the morning. There are 4000 loaded car movements a year. In No. 2 warehouse, devoted to shapes and fabricating work, the piles of stock, many of which have a length of 60 ft., lie parallel to the freight cars to avoid turning material in unloading;

Efficient horizontal storage is obtained by the use of cradles, chiefly for rounds from 2 in. to 8 in. diameter, in lengths from 18 to 25 ft.; for boiler tubes, T's, rails and reinforcing bars. Cradles are made of 4-in. T's, with triangles cut out of the section where the bends are to be made. These are bent into shallow U's and the bends are held in position by two plates at each bend, four rivets to the bend. In the old-style cradles straps were used instead of plates, with two rivets to the bend. A full set of cradles will hold about 30,000 lb. of 20 to 25 ft. bars. These can be stacked four high, thereby allowing 120,000 lb. to rest on a 3-ft. base.

Bars of only one size are placed in a set of cradles. The stock is so stacked that a complete variety of

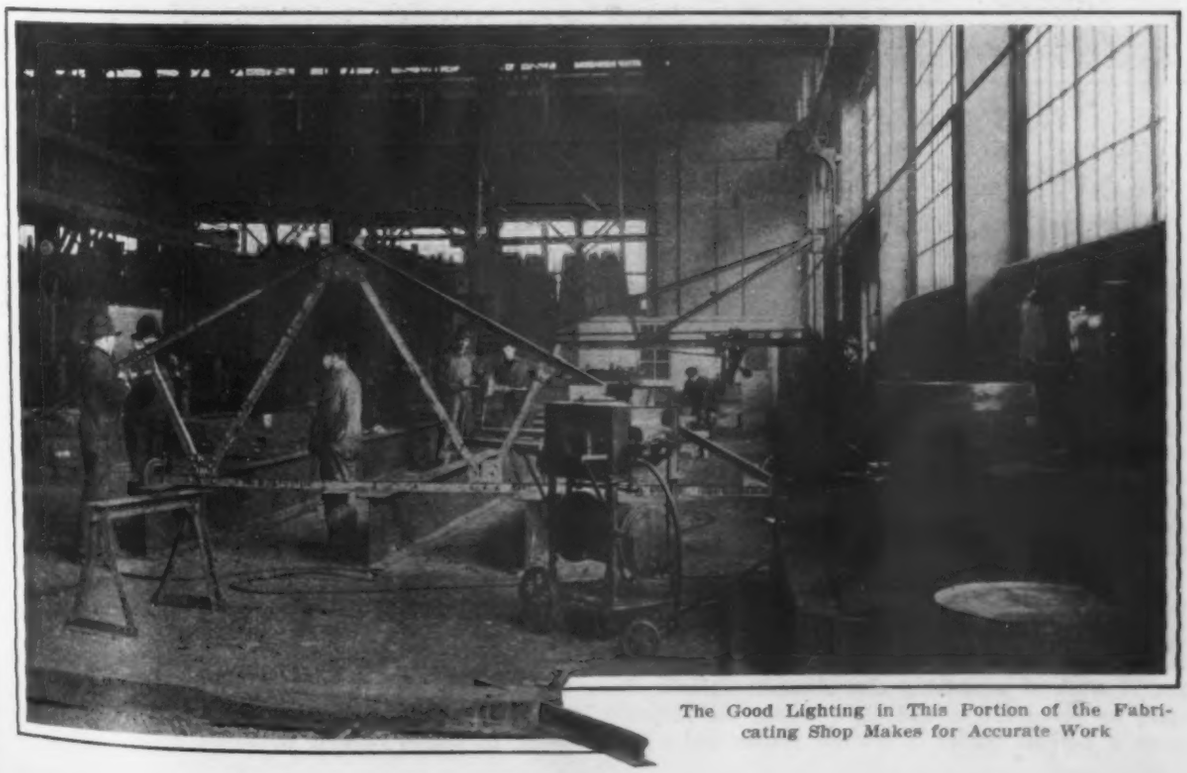
General View of No. 2 Warehouse, Showing Central Driveway and No. 3 Track in the Foreground. Since this is an old photograph, the view does not show the modern method of piling reinforcing bars in cradles

sizes is always at the top and hence available. A top cradle always rests upon the stock of the bottom cradle —not upon the bottom cradle itself. This system allows a vertical wall of stock rather than a pyramidal pile, as would exist without side supports. It is claimed that the cradles are more durable than the system whereby four posts are placed vertically into the floor, these gradually slanting outwards and interfering with adjacent storage space. There is enough space between cradles to allow the chains from the cranes to be fastened around a pile for removal.

The use of pigeon holes is minimized, being employed solely for tubes up to 2 in. in diameter and for cold-rolled shafting, where they are stepped up in tiers, the top pieces protruding farther than the bottom ones. The ends of some of the larger bar stock are painted in various colors, a certain color representing a certain mill from which the steel was purchased.

Extensive use is made of magnets, not only plates, sheets and scrap being transported in this manner, but cold-rolled shafting and tubes as well. The management claims that the old-fashioned method of handling short plates and heavy gage sheets with clamps at the end of crane chains was clumsy, slow and dangerous, and no chain arrangement was advisable for moving boiler tubes on account of possible damage to the material by chains. Though rope slings would not hurt the material, they took too much time and labor to adjust. The clamps would slip off. The company owns three magnets made by the Cutler-Hammer Mfg. Co., Milwaukee, Wis., one circular and of 36 in. diameter; the other two rectangular, 18 x 36 in. The magnets will lift 2000 lb. each. Where necessary, two magnets are suspended from a spreader beam.

An automatic reel, invented by the company's electrician and on which a patent is pending, provides that all the slack in the 30-ft. cable which delivers the cur-



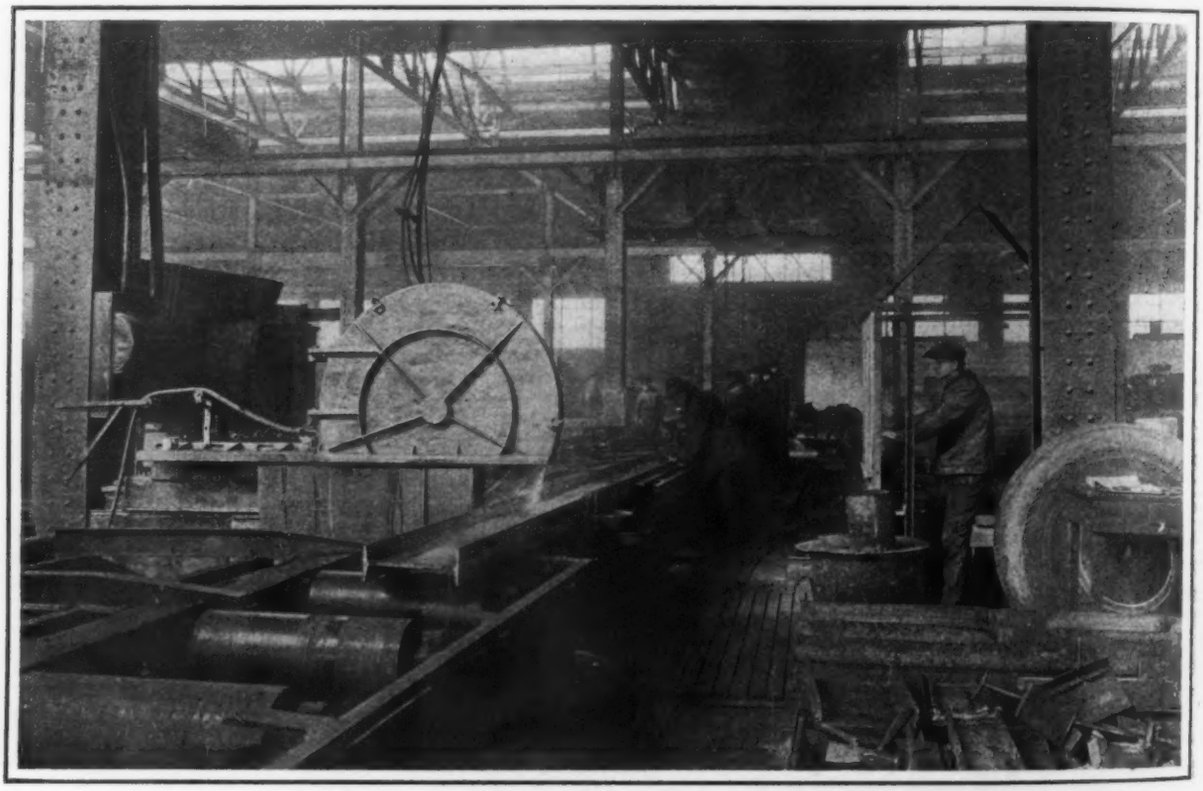
The Good Lighting in This Portion of the Fabricating Shop Makes for Accurate Work

rent to the magnet, is constantly taken up, thereby saving the cable, an expensive item, and keeping it out of the way. The present cable has been in use for 19 months and will probably last just as much longer. The reel is 24 in. in diameter and operates by a spring arrangement. The company has installed rheostatic control, which, by putting varying amounts of resistance into the line, allows an experienced crane operator to pick up the exact number of plates he requires or to drop his load one by one. Often the plates are distributed among several piles much as a deck of cards is dealt. The magnets are useful in both loading and unloading cars and trucks.

Besides its track scale of 150-ton capacity, its truck scale of 20-ton capacity, the company uses four dial scales and eight beam scales, each type having a capacity of 10,000 lb. The dial scale is the more modern and has certain advantages because of the speed with which it registers weight since it does not require the adjustment necessary for the beam scale, and because of its fewer chances of bringing about an error. In the beam scale the workman may fail to observe what size weight disk he is using; he may count up the disks wrongly; he may fail to make a perfect balance of the beam; and he may read the beam notch incorrectly.

The company's ownership of its own trucking system is unusual. Often this business is contracted for by an outside concern. The management believes in its own system because when men handle only iron and steel they become specialists and transport it more quickly and efficiently. In this business there are unavoidable delays in loading and unloading not common to other lines. The high prices per hour which contractors ask therefor make ownership preferable. Moreover, the company always knows just what moving equipment is available and does not have to suffer the inconvenience caused by trucking firms being occupied solely with other customers. When the full trucking equipment is not needed the drivers can be put to work at something else about the plant. Besides its seven trucks and eight teams, the company owns a 4-wheel trailer, a 2-wheel trailer and a pole truck. The routing of the delivery of long sections is in the hands of an experienced man, well acquainted with width, condition and peculiarities of streets. Some remarkably skilled deliveries of long material have been made by the company.

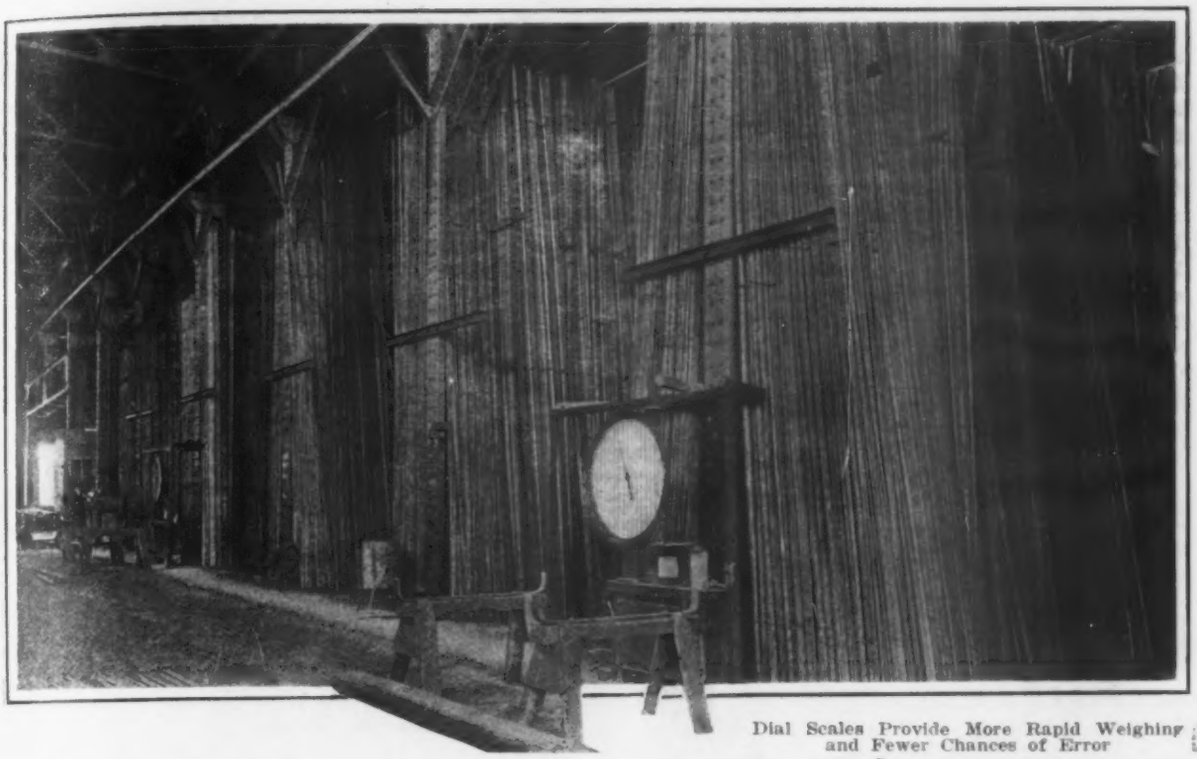
Each driver fills out each day a "log sheet," showing time of departure and time of arrival, with delivery ticket numbers. This gives time and location of delays with driver's explanation. In spite of all the management can do, each truck spends nearly two hours daily in loading and unloading at the warehouse, partly because of the inevitable order which crops up about six times a day and which "must go this morning" and for which the trucks must wait for the cutting. The cost per day of a horse-drawn team is about one-half the cost of a truck day in spite of the high price of feed. Horse-drawn teams are much cheaper for short hauls, wharf and freight station deliveries where many hours have to be spent in line to deliver material. The company can carry 30,000 lb. with a 5-ton truck and four wheel trailer.



The High-Speed Friction Saw with Motor-Driven Tables and Unit Control Allow for Efficient Fabrication

When the driveways were planned cognizance was taken of the fact that a 5½-ton Mack truck has a minimum turning radius of 27 ft. No sharp turns are required in the Morris, Wheeler warehouse. All trucks enter at one door and go out another. The network of driveways is so complete that if access to a certain portion of the plant is blocked from one approach, another approach may be employed.

The company secures considerable business that it would not get otherwise because of its fabricating equipment. The demand for this work helps move the plain material stock and to decrease the amount of scrap by using a great many ends left from plain cutting. The capacity of this department is about 500 tons per month and it is equipped to handle the structural steel for all classes of buildings and light bridges. Among the jobs recently done have been the steel for office buildings, theaters, power plants, electrical transmission and conveyor towers, coal trestles, chemical plants and miscellaneous plate and angle work, on orders ranging up to 250 tons.



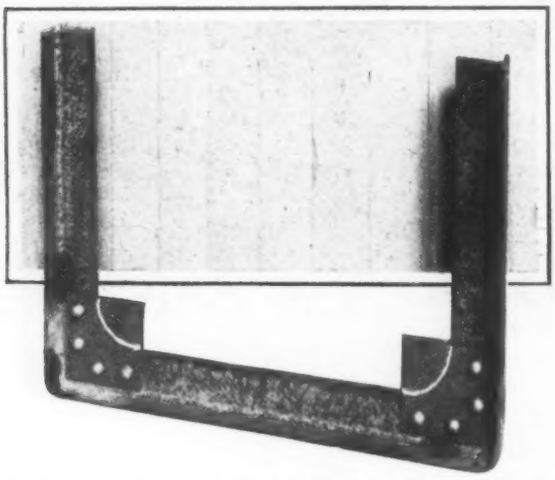
Dial Scales Provide More Rapid Weighing and Fewer Chances of Error

From 70 to 75 per cent of plain structural material sold is cut; 10 per cent is fabricated and about 5 per cent of the bar stock is cut. The fabricating and other cutting equipment in the plant consists of: A Ryerson high speed friction saw; an angle shear, plate shear and punch and shear, all of Long & Allstatter make; a Newbold multiple punch, an Espen-Lucas inserted tooth cold saw, a tube-cutting machine, a power hack saw, radial drill, bar bender, two sets of oxy-acetylene burning apparatus and portable oil-burning forges. The friction saw, which cuts all shapes to heaviest beams, has a motor-operated roller feed and discharge table. The control of the tables and the operation of the saw are focused at one point and manipulated by one man.

So economically is the fabrication accomplished that there is less than 1 per cent of scrap, or about eight carloads a year, which is taken back by the mills. The company has made and put in operation on the bar cutter a special set of blades for the shearing of channels up to 3 in., which is faster and more economical than running them through the big saw.

The Electro Magnet Handles Limber Plates with Facility. The slack on the magnet cable (at the right) has been taken up by the automatic reel

When the warehouse was constructed Mr. Sherman thought that a definite place could be chosen for each form and size and that everything should be kept in its place and never elsewhere. Due, however, to the variations of demand and supply, he changed this method, making it more elastic. Approximately the following is the allocation of material: Bay A, fabrication and storage of narrow plates and twisted bars; Bay B, channels and standard beams; Bay C, angles; Bay D, sections of special girder beams, rails and special channels, Z's and T's; Bay E, boiler tubes and plates. These are all in No. 2 warehouse. No. 1 warehouse contains steel, iron and Norway iron bars;



A Newer Style Cradle Before the Corner Plates Were Burned Off to the Chalk Marks

also small shapes. Sheets, cold-rolled material and hoops are kept in the basement of the office building where they will remain warm and dry.

The amount of heavy machinery, including cranes, all direct-driven by over 60 motors, and the general maintenance work about the plant necessitate an "overhead" gang, consisting of carpenter, electrician, mechanic and helpers, a total of six men. A small machine shop with lathe and drill press allows ordinary emergency repairs to be made quickly and at small cost. The recent determination of the company to repair and build its own motor truck bodies has indicated the need of a more roomy carpenter shop which is to be combined with more garage repair facilities in a small additional building to be constructed on the water front some time next spring.

The driveways are built of resurfaced, double-grouted Belgian block, on a 9-in. concrete base, with 1-in. sand cushion. The warehouse floor is of cinder in some portions; while in others, where heavier weights must be supported, it is of concrete, 10 in. thick, and reinforced in both directions by ⅝-in. twisted bars laid to 12-in. centers.

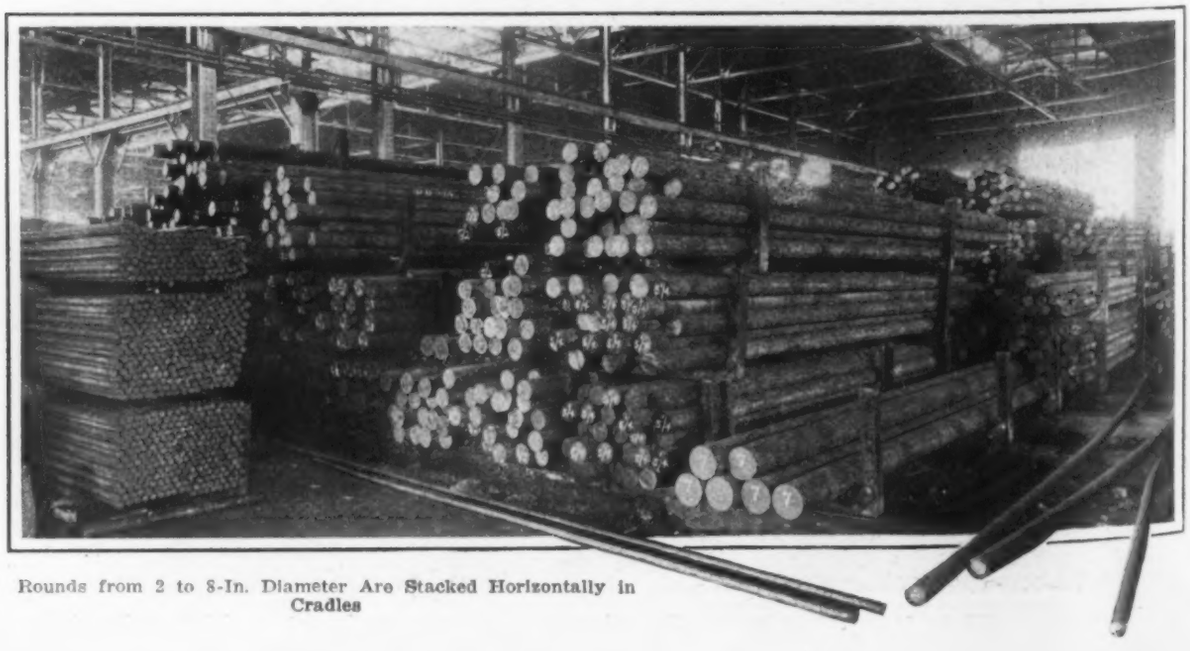
Unlearned Lessons in Exporting

A reader of THE IRON AGE who has recently returned from a trip to Chihuahua, Mexico, writes as follows:

"Our German friends are making a strenuous effort for the hardware and machinery business. A hardware merchant in Chihuahua stated that he was offered all kinds of prices on cutlery, granite ware, low-grade builders' hardware, etc., but that uncertainty of delivery was a deterrent factor in placing orders. He complained bitterly of substitution of goods on the part of American manufacturers, a lesson I thought they had learned more than 15 years ago. He also showed me a lot of American catalogs and circulars, all printed in English, and none giving weights and measures in the metric system, which is almost absolutely necessary. In a very short time all kinds of business will be very good in Mexico. Shelves are empty and most development work has been held back for years, but I am afraid that Americans will not get a full share unless they go after the trade right. Terms made by most American houses which do not have their representatives on the ground are positively absurd. Many old established houses which are very jealous of their standing are frequently asked for cash with the order."

Will Make Copper and Brass Tubing

The Shaw Metal Mfg. Co., Henry A. Shaw, president, has leased a site at Twentieth Avenue and Madison Street, Seattle, Wash., for 10 years for the manufacture of copper and brass tubing sheets and plumbing and lighting fixtures. A copper and brass tube plant will be in operation within six months. Four months later copper and brass sheet rolling machinery will be installed. Mr. Shaw says he will install sooner if he can get delivery of the machinery. The company will draw its raw products from the copper mines of Alaska through the smelter at Tacoma. The company will make lighting fixtures, auto shock absorbers, metal life raft bulkheads, road light reflectors, copper, brass and aluminum cooking utensils, coffee urn covers, cornice metal spinning, copper floats for boats, coppersmiths' ferrules, plumbers' supplies and art and crafts work. The officers are Henry A. Shaw, president, and L. H. Wheeler, vice-president, 524 New York block.



Rounds from 2 to 8-In. Diameter Are Stacked Horizontally in Cradles

Mining and Metallurgical Engineers

Discuss Electric Cast Iron, Molybdenum Steels, Gun Erosion and Blast Furnace Problems at Annual Meeting—Drill Steel Research

LEADING technical problems of the iron and steel industry were considered before the iron and steel sessions of the 123rd meeting of the American Institute of Mining and Metallurgical Engineers, held last week, Feb. 14 to 17, in the Engineering Societies Building, New York. These sessions were held on Tuesday, Feb. 15, morning and afternoon. The blast furnace, the electric furnace, molybdenum steels, gun erosion and other topics were discussed by authorities and the atttendance was large in each case. A most important discussion of the drill steel problem took up all of Wednesday, Feb. 16.

Molybdenum Alloy Steels

The present status of molybdenum alloy steel developments was presented by Dr. John A. Mathews, president Crucible Steel Co. of America, Pittsburgh, who presented in abstract his paper, "Molybdenum Steels," which is printed elsewhere in this issue.

Prof. Joseph W. Richards, Lehigh University, Bethlehem, Pa., who presided at both of the steel sessions, brought up the question as to what was the best way to manufacture molybdenum steels. He had been told by an alloy steel maker that there was less loss of molybdenum when a molybdate was used than when it was introduced through a ferroalloy or the metal powder. Dr. Mathews replied that he believed the ferroalloy, the powder or calcium molybdate were all equally satisfactory when properly used.

J. D. Cutter, metallurgist Climax Molybdenum Co., New York, read a written discussion which was, in part, as follows:

> Dr. Mathews has presented a comprehensive picture of this subject. It is especially gratifying to note the clear line of demarcation which he has drawn between the action of molybdenum in tool steels and in structural steels.
>
> As to the characteristics of molybdenum structural steels. Dr. Mathews has covered all of the outstanding qualities which have come under the observation of the writer except perhaps the fact that such impact tests as have been made have been favorable. Dr. Mathews believes that these steels will not entirely replace any of the older alloy steels and that their role will rather be to supplement and enlarge the sphere of usefulness of alloy steels in general. It is certain that no one is prepared to make a statement to the contrary. An illustration is found in the apparently marked adaptability which some types of molybdenum steel have exhibited for sheet metal parts such as automobile frames, axle housings, rims, etc., a field in which the other alloy steels have not played a very prominent part.
>
> In this connection, however, the thought presents itself that perhaps it would be a good thing if the movement toward standardization of steel specifications be carried a step further and a single type of alloy steel be agreed upon as standard. Of course, such a standard would only apply for general purposes. There are many special cases where the fitness of a particular type of steel is unquestioned. It seems apparent, however, that widely differing types of steel are now being used to meet almost identical conditions and that the preference of steel users for this or that type of alloy steel is often not based on fundamentals. The writer does not think that the time is ripe for such a move, but offers this idea as a possible development of the future.

While there were a number of metallurgists in the room ably qualified to speak on the subject, the discussion was not broad.

Electric Cast Iron

One of the most interesting of the papers presented was that by Dr. Richard Moldenke, Watchung, N. J., on "The Electric Furnace in the Iron Foundry," which was printed in THE IRON AGE, Feb. 17. Dr. Moldenke presented an abstract in his own words, concluding with the advice that iron foundrymen must keep their eyes on the electric furnace. He is fully convinced that the future of electric cast iron has many developments and surprises, particularly because of the increase in sulphur in cast iron scrap, not only in America, but in all countries. He stated that, while his paper estimated the cupola melting cost as $4 per ton, developments since he had written it were such that $2 was more nearly the present cost.

George H. Elliott, metallurgist Lunkenheimer Co., Cincinnati, sent in a written discussion which was read by Dr. Richards. Mr. Elliott was the first one to make public the possibilities and results of duplexing with the cupola about three years ago. In his discussion he said that, after four years' experience, he was convinced that there were three classes of iron castings into which electric iron could be incorporated. These were:

> Castings requiring high physical properties.
> Castings of thin sections.
> Castings requiring much machining.

Mr. Elliott contended that the superior quality of electric cast iron fulfilled all the requirements which could be met by the conditions listed.

W. N. Crafts, Dominion Steel Foundries, Montreal, Que., stated that he had had considerable experience with the electric furnace, which had suffered from the zeal of its friends. As to electric cast iron, he said he felt there was danger of getting the iron too hot and thus oxidizing it or causing it to be too brittle. He said that the seller made the prospective user see the results through rose glasses, whereas blue glasses really had to be used. Dr. Moldenke's reply was to the effect that it was necessary simply to let the iron stand a sufficient time before pouring if it appeared to be too hot.

The possibility of alloy cast iron was brought up by a question from Edwin F. Cone, associated editor THE IRON AGE, New York, who asked whether or not the electric furnace would make possible the production of iron castings containing nickel, chromium, etc. Dr. Moldenke said that the only way, in his opinion, that this was economically and satisfactorily possible was by introducing such alloys through the pig iron and not by the use of ferroalloys, and that he was now conducting a series of experiments in cast iron made with Mayari pig iron of the Bethlehem Steel Co.

Electric Ferromanganese

Electrically made ferromanganese was discussed by Robert M. Keeney in a paper on "The Manufacture of Ferromanganese in the Electric Furnace." The paper, written by Mr. Keeney, director of metallurgical research Colorado School of Mines, Denver, and by Jay Lonergan, chief engineer Roy Development Co., Wenatchee, Wash., is a detailed record of the experience during the war of making ferromanganese with western ores at Utah Junction, Col. The metallurgical and cost problems were treated in detail and a comparison is made between this process and the blast furnace. Mr. Keeney said that the same recovery of manganese, 72 per cent, was made in the electric furnace from ore containing 34.8 per cent manganese and 13.2 per cent silica as in the blast furnace from ore containing 40.33 per cent manganese and 8.6 per cent silica. The electric furnace consumes approximately one-quarter of the carbon required by the blast furnace.

It is probable, according to the authors, that on the same grade of ore the electric furnace would show at least 5 per cent greater recovery than the blast furnace. The average cost of production, f. o. b. plant, inclusive of taxes, interest, depreciation and sales expense, during the period of four months when materials on hand permitted continuous operation of one 1100-kw.

furnace was $176.41 per gross ton. Mr. Keeney stated that under present conditions this cost would be reduced about 50 per cent. The author concluded his paper with the statement that considerable reduction in the cost of production in the electric furnace is possible if the Söderberg continuous feeding electrode, now installed in one plant in this country, continues to be a success and if the unaccounted for loss of manganese can be decreased.

In discussing this paper Dr. Richards suggested that the loss of so much manganese in the slag might possibly be lessened by the use of alumina instead of lime in the charge, and that as a result, also, much less carbide would be produced. He discussed the details of the construction of the Söderberg electrode for the benefit of those who might not be familiar with it and outlined, also, its advantages. He said that two such electrodes, 32 in. in diameter, were in use by the Southern Manganese Corporation, Anniston, Ala., and that in two other cases a 34-in. and 37-in. electrode were successfully operating. He expressed the belief that, particularly in Europe, this electrode bids fair to ultimately displace the standard electrodes of to-day. Asked as to whether it was possible to use this electrode on a tilting steel furnace, he stated that he had seen them in use on a Heroult furnace at the Stavanger Steel Works, Stavanger, Norway, and that he saw no difficulty in the ultimate use of this type of electrode in general steel making furnaces.

Dorsey A. Lyon, United States Bureau of Mines, Washington, testified as to his experience in watching the operation of these electrodes in Alabama and said that he was surprised at the ease and smoothness with which they worked.

Blast Furnace Papers

Two papers were presented dealing with problems of the blast furnace, one entitled "The Importance of Hardness of Blast Furnace Coke," by Owen R. Rice, Bethlehem Steel Co., which was abstracted in THE IRON AGE, Feb. 10. It was presented in abstract by Mr. Rice. He supplemented the paper with the statement that the company was now using, in the special apparatus for testing the hardness of coke, a larger drum, a 50-lb. sample and 18 steel balls. Mr. Rice concluded his presentation with the statement that he believed that it was important also to have some means of determining the combustibility of the coke used in blast furnace practice and that a suitable test for this was very highly to be desired.

Dr. Moldenke called attention to the equal importance of testing the hardness of coke for foundry practice and expressed his admiration of the work described by Mr. Rice, and said that method of testing was better than any heretofore used and more scientifically accurate.

A new method for the measurement of blast furnace gas was presented in a paper entitled "Measurement of Blast Furnace Gas," by D. L. Ward, general superintendent Federal furnace plant, By-Products Coke Corporation, Chicago, and R. S. Reed, Semet-Solvay Co., Ashland, Ky. This brief paper is abstracted on other pages of this issue. The discussion that was brought out by the chairman revealed that the apparatus described was accurate and one long needed by the industry, and superior to Petot tubes.

Nitrogen and Gun Erosion

An elaborate paper on "Nitrogen in Steel and the Erosion of Guns," by H. E. Wheeler, Chicago, was presented in abstract. It is based on experiments which followed three lines of work: The effect of nitrogen under pressure on steel containers of various compositions at a red heat; the effect of decomposing ammonia on various alloy steels, iron and non-ferrous alloys; a new theory of the erosion of guns in respect to the effect of nitrogen in steel. The author discussed the gas-leakage theory, the cold-work theory, the martensite theory and the nitrogen theory of erosion. Some apology was offered by the author "for the large number of expressions of opinion which are not sufficiently supported by experimental evidence. But for the most part probability was sought for to the sacrifice of elaborate proof, and the results are offered, not as a completed research, but in the hope that they may be of some interest to those now working on similar problems."

The author offers the suggestion "that the hard white layer of an eroded gun is a locally cold-worked austenitic case due to penetration of nitrogen. Since nitrogen under pressure and with heat penetrates and combines with steel, it would be strange, indeed, if the reaction did not occur in the bore of a gun where there is an atmosphere of from 35 to 45 per cent nitrogen, very hot and fresh from combination of another sort; i. e., nascent and under a pressure of 30,000 to 45,000 lb. per sq. in. Since even molecular nitrogen has been shown to react at 500 deg. C. and 1500 lb. per sq. in., the reaction must occur in a gun. By assuming that the white layer on the inside of a gun is the same as that which can be produced by nitrogen, most of the loose ends of previous theories are picked up. For that reason, and more especially because it offers a way out, this idea is offered for consideration." The paper is replete with photomicrographs.

G. F. Comstock, Titanium Alloy Mfg. Co., Niagara Falls, N. Y., in the discussion, stated that

> the paper brings out some very interesting facts regarding the effect of nitrogen in steel and the author's theory regarding the erosion of guns seems the most reasonable of any that has been advanced. There seems little doubt now that nitrogen is a factor of major importance in this erosion and it is surprising that it escaped the attention of other investigators. Some aspects of the author's metallographic conclusions, however, seem open to criticism. He has failed entirely to appreciate the work done on the structures due to nitrogen in fusion welds of steel by Ruder, Miller and myself. This work has shown definitely that there is a metallic constituent in the metal deposited in such welds which is capable of assuming different forms after heat treatment and which is not a carbide but must contain nitrogen in some form. To call this constituent "iron nitride" may be unwarranted, strictly speaking, but the name is convenient and truly descriptive. * * * Through a suggestion of Dr. Ruder of the General Electric Co., a solution has recently been developed in this laboratory which will make the distinction between constituents due to carbide and those due to nitride easily possible.

Two papers, presented in abstract by representatives of the authors, were "Surface Changes of Carbon Steels Heated in Vacuo," by Dr. E. Heaton Hemingway, research metallurgical engineer, and George R. Ensminger, research chemist, Watertown Arsenal, Watertown, Mass., and "Chemical Equilibrium Between Iron, Carbon and Oxygen," by A. Matsubara, assistant professor of chemistry, Kioto Imperial University, Kioto, Japan.

The Drill Steel Problem

A whole day, Wednesday, Feb. 16, was devoted to a symposium and discussion on a subject exceedingly important to the mining industry. It had to do with a proposed research on the breakage and heat treatment of drill steel, in co-operation with the United States Bureau of Mines, American Society for Steel Treating and engineering division of the National Research Council. Representatives of all of these organizations were present, as well as other well-known metallurgists and producers of tool steel.

B. F. Tillson, New Jersey Zinc Co., Franklin, Pa., was the chairman and the enthusiastic leader and promoter of the meeting. He opened the morning and afternoon sessions with a clear presentation of the problems involved, showing the excessive breakage of the average drill steel and what this means in expense, loss of time, inefficiency, etc. Drill steel is subject to some of the most drastic conditions that any steel is called upon to meet. Even if made of the best material and delivered to the user in the best condition, it has to undergo severe strains and shocks in its regular use in rock drilling and also it may fall into the hands of men who heat-treat and sharpen it for re-use, who do not always give it the most scientific treatment. The element of fatigue was suggested as perhaps an important factor in causing breakage.

The discussion embraced such subjects as a study of the steels which give the greatest service before failure by breakage of drill steel, involving the nature

of the sections, the composition, methods of manufacture; maximum service which might be expected, such as life of steel, methods of heat treatment, standard methods of recording service; mechanics of failure, involving microanalysis, nature of stress, detection of incipient failure and failure due to fatigue; methods of machine development for accelerated tests and nature of forces involved; correlation of field tests with accelerated laboratory tests; reclamation of depreciated drill steels before and after failure; methods of heating using oil-fired, electric or other furnaces, and the welding of fractured steel.

Dr. Van H. Manning, United States Bureau of Mines and formerly director of the Bureau, offered a resolution to the effect that the American Institute of Mining and Metallurgical Engineers be given the authority to direct a research into this important subject in cooperation with all other leading technical, engineering and industrial societies which it may consider advisable to ask to join, most of these being mentioned in the resolution.

Several written discussions of various phases of the subject were read. Dr. Hoffman, Colonial Steel Co., Pittsburgh, brought up the subject of vanadium-carbon tool steel, referring to its greater range of heat treatment temperature and other advantages, particularly its toughness. Charles M. Brown, vice-president Colonial Steel Co., cited the trouble at one time encountered in the making of eye bars which tended to break near the border of the treated and untreated portions of the steel. This might be the cause of some of the present trouble with drill steel.

The question of fatigue and drill steel failure was touched upon by Prof. H. F. Moore, University of Illinois, Urbana, Ill., and now in charge of the research on fatigue of steel for the National Research Council. Prof. Moore stated that so far as the results of his work had gone, there was no case of steel failure under repeated stress which could not be explained as originating in some defects or slight nuclei in the steel.

Dorsey A. Lyon called attention to the importance of a successful solution of this problem in that it would decrease the cost of mining and enable lower grade ores to be worked.

Dr. Charles W. Burrows explained the details of his defectoscope as applied to the detecting of flaws in steel rods. This was described in THE IRON AGE, Oct. 28, 1920. Dr. Burrows believed that this instrument might aid in solving the problem of locating defects in the original rods of drill steel.

The question of electric heat treatment and the welding of unused portions were also discussed.

Industrial Motion Pictures

A large attendance and unusual enthusiasm characterized the first presentation by the United States Bureau of Mines of its motion pictures on the mining of sulphur, the mining of asbestos and the manufacture of asbestos products and the making of ingot iron by the American Rolling Mill Co., Middletown, Ohio. The last was a remarkable picture in many respects, not only in the clear and unusual views of different steps of the process, from the beginning to the production of plain and galvanized sheets, but also the striking reproduction of the melting process in the open-hearth furnaces. All of these pictures are available for distribution for educational purposes.

The Banquet

The institute held the largest banquet in its history at the Waldorf-Astoria Hotel, Wednesday evening, Feb. 16. The two principal speakers were the outgoing president, Herbert Hoover, and the new one, Edwin Ludlow. Mr. Hoover dealt with the accomplishments of the institute in the past year, and Mr. Ludlow with the possibilities and expectations of the future. As a souvenir, each guest was given a monel metal watch chain by the maker of this alloy.

An account of the new officers for the new year appeared in THE IRON AGE, Feb. 17.

Present Status of Molybdenum Steels*

Air-Hardening and High-Speed Steels Containing Molybdenum —Future of Molybdenum Alloy Structural Steels Assured

BY DR. JOHN A. MATHEWS

IT is twenty years since the writer made his first molybdenum steels and others were making them commercially five years earlier, but the prevailing opinion seems to be that molybdenum steels are new; from time to time the daily press speaks of important discoveries in Europe and intimates that American steel makers have much to learn in regard to alloy steels. The earlier experiments were largely confined to the use of relatively high percentages of molybdenum in tool steels and permanent magnet steels. Recent developments deal with the types of alloy structural steels used for airplane, automobile and other engineering requirements; in these, the molybdenum content is usually less than 1 per cent. The earlier types generally have been unsuccessful commercially, but the newer types of steels are becoming of increasing importance.

The war showed our dependence on foreign sources for alloying metals; molybdenum alone is widely distributed in the United States and seemingly abundant. Many deposits are not now of commercial interest, owing to location and relatively small amount of ore available, but other deposits are being developed and a stable source of supply seems well assured.

In tool and magnet steels it was early found that 1 part of molybdenum was equivalent to from 2 to 2.5 parts of tungsten. The permanent magnet steels investigated by Madame Curie, in 1898, contained from 3.36 to 4.05 per cent molybdenum; in 1902, Dr. E. L. French and the writer thoroughly tested steels containing from 2 to 4 per cent. These steels gave satisfactory tests for permanence, but were low in residual density and much more sensitive to hardening than the corresponding tungsten products. We discontinued work with them, therefore, and have no advice that such steels have been used commercially here or abroad.

Air-Hardening and High-Speed Steels

Prior to the development of the Taylor-White process and the modern high-speed steels, air-hardening steels were in general use. These were high in carbon and usually contained tungsten and chromium, the latter having replaced the manganese of the original Mushet air-hardening steels. Later, the tungsten content was frequently replaced by molybdenum. An air-hardening steel largely used had the following analysis: Carbon, 1.75 to 2 per cent; molybdenum, 3.75 to 4.25 per cent; chromium, 3.75 to 4.25 per cent.

In the earlier years of the twentieth century, high-speed steels quickly displaced the air-hardening steels. Most of the manufacturers confined their efforts to tungsten-chromium combinations, but in America determined efforts were made to use molybdenum instead of tungsten. At the time that one European metallurgist was claiming that steel containing over 6 per cent molybdenum could not be rolled, we were commercially rolling large quantities of a steel containing over 9 per cent molybdenum and had successfully rolled steel containing up to 15 per cent. The use of molyb-

*From a paper delivered at the February meeting of the American Institute of Mining and Metallurgical Engineers in New York, Feb. 15, and copyrighted by the institute. The author is president Crucible Steel Co. of America, Pittsburgh.

denum above 6 per cent was patented,* as was the use of vanadium with either tungsten or molybdenum in high-speed steel.†

So far as molybdenum was concerned, the manufacture of these steels was discontinued almost before the patents had been allowed. One of these patents has now expired, but "discoveries" of chrome-molybdenum-vanadium steel and molybdenum-vanadium steel for high-speed purposes were recently announced. Both of these types of steels were made and abandoned nearly 20 years ago, as they were found, after very exhaustive experiments and tests, to be unsatisfactory both to manufacturer and in use. Occasionally these steels gave extraordinarily good service, as measured by the standard of that time, which were much below the present standards of the leading high-speed steels. However, notwithstanding the discouraging results of the earlier experiments, the writer has felt that some time we should have to use molybdenum, due to shortage of tungsten, or for other economic reasons, and from time to time during the past 20 years we have repeated our experiments with these steels, with the hope that the general advancement in the art of manufacture might help us to overcome the earlier difficulties and objectionable features.

Instability of Molybdenum

One of the principal difficulties with molybdenum in high-speed steel is its tendency to volatilize at the high temperatures necessary in the working and hardening of the steel. After prolonged or excessive heating, a well-defined zone on the outside of the bars or tools is entirely different from the interior in structure, and as a result, finished tools, such as drills and cutters, which cannot be given the grinding permissible with lathe tools are not satisfactory; this has greatly limited the use of molybdenum high-speed steels. Both vanadium and cobalt have been tried in an endeavor to overcome this difficulty. Recently it was stated that cobalt and vanadium are "stabilizers" for molybdenum, but the writer has seen no evidence to confirm these claims. On the other hand, molybdenum high-speed steel containing either or both of these elements has shown the defect in a marked degree. Some experiments now in progress promise more satisfactory results, but it has not been determined whether our "stabilizer" in any way impairs the cutting qualities.

Cobalt-molybdenum-vanadium high-speed steel was made and abandoned in America before the beginning of the European war, for it was found inferior to the regular tungsten-vanadium steel products with or without cobalt. After reading recently that cobalt-molybdenum-vanadium high-speed steel was the latest foreign contribution to tool-steel metallurgy, some of the cobalt-molybdenum-vanadium material made in 1914, some ingots made along similar lines in 1919, and some of the European steel were used in exhaustive and carefully conducted tests made by the Halcomb Steel Co., in which the leading brands of American and foreign manufacture were used. The molybdenum products failed to give satisfactory results and were rated much below the standard tungsten high-speed steels on the market to-day.

Alloy Structural Steels

For the modern developments in the use of molybdenum we are greatly indebted to C. Harold Wills of Marysville, Mich. Having become convinced that there was abundant ore in this country, he experimented with molybdenum in a great variety of combinations. Much has been published regarding the physical properties and suggested types of molybdenum-alloy steels, but we would refer to the papers by Dr. George W. Sargent,‡ J. D. Cutter,§ and Charles McKnight, Jr.,¶ the booklet entitled "Molybdenum Commercial Steels" by the Climax Molybdenum Co. and the booklet of the Crucible Steel Co. of America entitled "Almo Steels." While much of this material is propaganda, it is based on experiments made in our own laboratories and plants, in those of the Carbon Steel Co., United Alloy Steel Co. and by Messrs. Wills and Chandler, formerly with the Ford Motor Co.

In the mills, molybdenum steel has been found to work satisfactorily, being relatively as free from seams and similar defects as the older types of alloy steels; it is also freer from thick and tenacious scale than are the nickel and chrome-nickel types. It seems to flow readily, particularly in drop forgings, and can be worked over quite a wide range of temperature, say, from 2100 to 2500 deg. F. (1150 to 1370 deg. C.), though the higher temperature would not be recommended for steel containing above 0.25 to 0.30 per cent carbon.

Molybdenum and Heat Treatment

The steel seems to have a wide safe heat-treatment range, as measured by static tests. But it is not advisable to stress this point, as it leads to carelessness in heat treatment. In addition, it has been found that static tests are somewhat misleading in this regard. While many steels of high quality can be forged or heat treated through a considerable range of temperature without apparent loss in static qualities, dynamic or shock tests seem to indicate that for every steel there is a temperature at which the maximum of static and dynamic qualities are obtained. Shock-test methods in this regard are of especial value in supplementing our knowledge of materials or even in detecting faulty heat treatments that static tests do not show. Molybdenum steels seem to machine more readily at a given Brinell hardness than do other steels. This would mean, of course, that parts that must be heat treated and machined afterward could be utilized in a state showing higher physical properties than have been customarily obtainable. The physical property on which molybdenum seems to exert most effect is the reduction of area, which is usually considered a good measure of toughness.

Molybdenum, particularly in conjunction with chromium, seems to confer the property of deep hardening. This is to expected from the observation that molybdenum steels resist the drawing temperature to quite an unusual degree. In other words, they require a higher drawing temperature to reduce the physical properties by the same amount that they would be reduced in similar steels without the presence of molybdenum. This indicates that molybdenum tends to keep the carbon in steel in the combined or martensitic form, and when in that condition to retard its passage to the sorbitic or troostitic state. Some years ago the writer sent to Prof. H. C. H. Carpenter, then at the National Physical Laboratory of Great Britain, a chrome-molybdenum steel together with a variety of commercial high-speed steels for use in his investigations upon the drawing or softening of hardened high-speed steels. This particular steel contained but 4 per cent of molybdenum, 3 per cent of chromium and about 0.47 per cent carbon, yet it resisted the draw-back temperature, as measured by Professor Carpenter's etching method, to a greater extent than any of the commercial tungsten high-speed steels used by him, whether of American or British manufacture.

It is possibly too early to make predictions, but the writer believes that molybdenum has established for itself a permanent place among the alloy steels found useful to the airplane, automobile and general engineering trades. It will not wholly displace any other type of steel, but the effect of improvements of this kind and of new products has been rather to extend the field of usefulness than to eliminate products of previously demonstrated merit. The Bessemer and open-hearth processes, and the electric furnace have not displaced the original crucible cast steel business. The demand for steels made by each method has arisen with the process itself.

Not only does molybdenum below 1 per cent give no trouble from volatilization, but it may be recovered from scrap to a large extent when remelted in the open-hearth furnace.

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*C. H. Halcomb: U. S. Patent 722504 (March 10, 1903).

†J. A. Mathews: U. S. Patent 779171 (Jan. 3, 1905).

‡Molybdenum as an Alloying Element in Structural Steels. Amer. Soc. Test. Mat. (1920).

§Suggested Method for Determining Comparative Efficiency of Certain Combinations of Alloy Steels. *Trans.* Amer. Soc. Steel Treat. (1920) 1, 188.

¶Molybdenum Steels. *Trans.* Amer. Soc. Steel Treat. (1921).

Preparing for General Tariff Legislation

Much Will Depend Upon Administrative Features of the New Law—Complicated Questions Connected with World Conditions

WASHINGTON, Feb. 22.—Preparations for the framing of emergency general tariff legislation under the Harding administration have been begun. Hearings of the subject were concluded last Wednesday by the House Committee on Ways and Means, following which Chairman Joseph B. Fordney departed for Florida to confer with the President-elect. At the same time, work of indexing the hearings for the sake of convenience for purposes of reference was started and will be completed this week, according to plans. The next step will be the writing of the actual bill by Republican members of the committee, sitting in executive session and determining upon rates. Administrative features of the proposed act will be worked out by subcommittees, whose efforts will be confined solely to this phase of the undertaking, but these subcommitees will not be named in the immediate future. The entire committee will sit continuously during March in order to be ready to present the bill at the special session that will be called in April.

It is proposed by the committee that tariff legislation shall be passed in the House before taking up revised revenue legislation. It is intended that the latter shall be taken up while the Senate works on the tariff bill.

If the permanent rates to be decided upon in the law that will be framed later based on after-the-war conditions are lower than those in the emergency act, rebates will be allowed to importers, but if the emergency rates are higher than the permanent ones, importers will not be required to pay the difference.

Chairman Fordney's Position

While it is understood there is a difference of opinion between Republican members of the House Committee on Ways and Means as to tariff legislation, as well as a variance between this committee and the Senate Committee on Finance, it is plainly the attitude of Chairman Fordney that substantial duties should be adopted. His rank as head of the committee obviously places him in a strong position that other members cannot disregard and it necessarily may be expected that his ideas will be reflected to a great extent in the measure when it comes before the House. Democratic members of the committee, throughout the hearings, have assumed a traditional stand against high duties, except where products of their direct constituencies are concerned, making of the tariff, as of old, a "local issue," as was observed by General Hancock.

Administrative Features

The actual rates in the measure apparently are to depend more than ever upon administrative features, though they may follow in many respects those of the Payne-Aldrich bill on numerous commodities, including iron and steel. But attention has been given to a new system of constructing a tariff for this country which, if adopted, will have a bearing on the actual rates. This relates to a proposal to place rates now on an ad valorem basis on a specific basis, to be established on domestic exchange rates and of making duties collectible at either the delivered price at the port of entry or at the market value in this country. For instance, it would be, in the case of iron and steel importations, a matter of collecting duties at either the delivered price, port of entry, or on the Pittsburgh basis, which would be the market value, instead of determining the amount collectible from consular invoices, though the foreign cost of production would be taken into account, the freight rate being added. Importers appearing before the committee protested against a change in the present system of invoicing values, and also objected to the proposal suggested by some members of the committee that the values be based on those prevailing at the time of arrival of shipments, rather than at the time shipments were made.

The Exchange Problem

The question of international exchange necessarily is involved in this plan, but it has been pointed out that its fluctuation may easily be, if indeed it will not probably be, to the advantage of the importer, based on the assumption that industrial conditions in foreign countries will improve. With the transfer of ad valorem duties to a specific basis, it is maintained that this, under the plan suggested, would call for duties not in excess of those of the Payne-Aldrich act, but that some now on a specific basis would have to be made higher owing to the low rate of exchange.

Judge Marion De Vries of the United States Customs Court of Appeals has proposed a draft authorizing the President to determine the net difference between the cost of production in the United States and abroad and to be empowered through proclamation to order additional duties, when necessary. This has been looked upon by some with favor; by others with disfavor. It has been compared with so-called orders in council which over night could make changes in tariff rates and has been objected to for several reasons. While Chairman Fordney and others are understood to be vigorously opposed to anything in the way of reprisals or bargaining, the suggestion as to giving the President the power mentioned, it is said, is an instrument which would readily lend itself to such action. Moreover, it is contended that serious difficulty would be encountered and ill-feeling engendered by other nations in any attempt to make investigations as to costs of production abroad, which would be possible only through permissions of the countries involved. There also has been discussion as to the feasibility of establishing minimum and maximum rates based on the cost of production, a question that finds a divergence of opinion as to its constitutionality.

Opposed to German Importations

Questions asked at the hearings by Chairman Fordney indicated that he is insistent upon adequate protection against German importations and desires to avoid any kind of discrimination against Canada.

It is quite evident that the present free list is going to be narrowed considerably. In this connection, interest is manifested as to what effect it may have on ores used in the manufacture of iron and steel and on iron and steel products. It is believed that such articles as pig iron, and steel billets, blooms and slabs not containing alloys, now on the free list, will be made dutiable, on or near the Payne-Aldrich basis. If this is done, such a rate may be applied to iron ore. This would also indicate that protection will be afforded makers of ferromanganese, who have asked that this product be separated from the pig iron schedule and classified in a distinct paragraph. But it is doubted whether a duty of 2c. a pound, as requested, will be adopted. Some members of the committee already have pointed out that they do not think the existing market

value can be maintained and that more nearly normal pre-war prices may be expected in the not distant future, and these, they observed, were considerably lower than the suggested duty alone would amount to.

Proposed Duty on Ferromanganese

The request of makers of ferromanganese for a duty has given a cue to producers of manganese ore to ask for a duty to equalize the cost of producing abroad and in the United States. They insist there are much greater potential resources of high grade manganese ore than Government reports indicate and that they could supply ferromanganese producers in the United States.

Frank W. Griffin, representing the Tungsten Mines Co., urged a duty of $10 per unit of tungsten trioxide, a unit being 1 per cent of a ton. Chrome ore interests also asked for a protective duty. John R. Lightfoot, Shelton, Conn., representing that portion of the iron and steel industry which produces tacks and small nails, now on the free list, asked for a duty of 37½ per cent.

PATENT OFFICE BILL

House Agrees to Conference Report—Moderate Increase in Salaries

WASHINGTON, Feb. 22.—Agreement to the conference report on the Nolan bill to increase the force and salaries in the patent office having been reached by the House last Wednesday, it is believed that similar action will be taken by the Senate before adjournment of the present session of Congress and that the measure will be signed by President Wilson before he leaves office.

Vigorous protest was made by a number of members of the House against the section which grants authority to the Federal Trade Commission to take out and work patents for Government employees. The claim was made that this section, incorporated in the Senate, makes it possible to control the price at which certain manufactured products are sold. Representative Merritt, Connecticut, said that this would allow the Government to enter into competition with private manufacturers and that it would result in the building up of a new patent system under the Federal Trade Commission. He was unsuccessful in his attempt to have the House adopt an amendment to recommit the bill with instructions to House conferees not to agree to this section.

The bill as agreed to provides for 48 new employees and increases the total number to 1048. It provides a salary of $6,000 for the Commissioner of Patents, $5,500 for the first assistant, $5,000 for each of five examiners and ranges down to $3,100 for each of 30 assistant examiners.

The need of this legislation has long been recognized and urged by business interests of the country, though many opposed the inclusion in it of the section granting the authority stated to the Federal Trade Commission. Despite the great value derived from the Patent Office in the interest of science and industry, requiring technical men with high qualifications, the salaries paid always have been ridiculously low. They have been increased only 10 per cent since 1848, or within a period of 72 years. The result has been that they are paid less than that of the average Government employee. Even the new bill does not provide the average pay of other employees of the same class, because they will receive an average of only $1,277. The effect of this is seen when it is recalled that resignations have been exceptionally numerous. Representative Davis of Tennessee said that from May 1, 1919, to Oct. 1, 1920, 17 months, there were 122 resignations of patent examiners. They resigned to accept employment at higher salaries in private life.

It is a curious fact that such low salaries should pertain to the Patent Office when it occupies the peculiar position of being probably the only department of the Government which is run at a profit instead of a loss. The receipts of the Patent Office always have amounted to more than expenses. During the entire period of its existence there has been an accumulation of more than $8,000,000 in receipts over expenditures, but which, of course, was covered into the Treasury. It is estimated by the Patent Office that the increased fees will more than overcome the increased personnel and salaries. During 1920 there was a 36 per cent increase in the business of the Patent Office over that of the previous year. There was a 24 per cent increase in receipts even under the existing schedule of fees, which now are $35 and are to be increased to $40. While the Patent Office was created in 1837, it did not begin to function until 1840, when there were 765 applications for patents, which compares with 86,815 applications in 1920. The bill also increases the price of copies of patents from 5 to 10 cents, which it is estimated will bring in a sum in excess of that required for additional salaries for those engaged in supplying copies. The surplus of the Patent Office in 1920 was $107,850.

Arguments For and Against Trackless Street Cars

WASHINGTON, Feb. 22.—Both favorable and unfavorable conclusions have been formed regarding the feasibility of the new type of trackless street cars tried in Bradford, England, according to a report from American Consul William J. Young, received by the Bureau of Foreign and Domestic Commerce. A controversy has arisen as to whether or not such cars should be put on three routes now served by the ordinary street car running on rails, in order to save the expense of repairing the present tracks. The engineer and manager of the Bradford Corporation Tramways is quoted as saying that the local authorities have come to the conclusion that in the future railed street cars would be a more expensive luxury than any community can afford. Reference was made to the interest on the money which it would be necessary to borrow for repairs plus sinking fund, which would amount to 10¼ per cent per annum. It is claimed that the trackless car which was given a trial had run 7603 miles without a single breakdown. The Lord Mayor and a delegation from Birmingham are said to have inspected the trackless cars and given their approval of them.

On the other hand, the observations of a deputation which interviewed the local authorities in opposition to the suggestion to institute these new services have been published. Adverting to the financial argument, it is pointed out that they are founded on present prices without taking in account that prices may be normal three years hence. Further objections were that the new car is not capable of negotiating steep gradients with acute bends; that with the severe winds prevalent in exposed places on hill there would be danger of accidents during storm; that they throw up a great deal of dust and mud; that it has been found difficult to restart them after a stoppage in snowy weather; that vibrations are too great; that there is an absence of luggage accommodation; that during foggy weather, owing to the difficulty of the driver to see his way, suspension of service is necessary; that the cars would be top heavy and dangerous in heavy gales and that there would be danger of skidding in snowy weather.

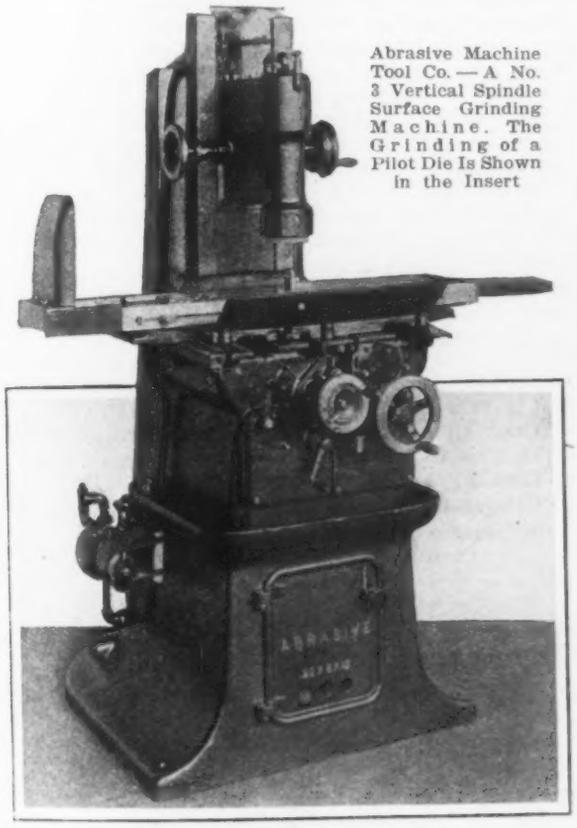
Powdered coal for power plants was discussed recently before the American Society of Heating and Ventilating Engineers by Frederick A. Scheffler. A reprint of the paper in pamphlet form is available and probably a copy may be obtained from the Fuller Engineering Co., Allentown, Pa.

The Driggs Mfg. Corporation, New Haven, Conn., last week shipped a 167-ft. lathe, weighing approximately 300 tons, to a Government New York workshop, where it will be used chiefly for working 16-in. guns. It was shipped in sections in about a dozen cars.

A New Surface Grinder

A small but sensitive vertical spindle surface grinding machine designed for certain classes of production as well as for tool room work is being marketed by the Abrasive Machine Tool Co., East Providence, R. I. It is said to be especially economical in the grinding of pilot dies, possessing the following advantages: it obviates the use of the much bigger machine of the horizontal spindle type, which is necessarily larger in order to secure the large wheel diameter required to clear the pilots of the die; the cupped wheel of the new vertical machine leaves the cutting edges of the die keen, whereas with the disk style of wheel the edges are more or less "dubbed" over; and the grinding time is materially lessened. The squaring of shaft ends on centers and the surfacing of small pieces held by the magnetic chuck come also within the field of the machine.

The grinder has a capacity of 22 in. longitudinal



Abrasive Machine Tool Co. — A No. 3 Vertical Spindle Surface Grinding Machine. The Grinding of a Pilot Die Is Shown in the Insert

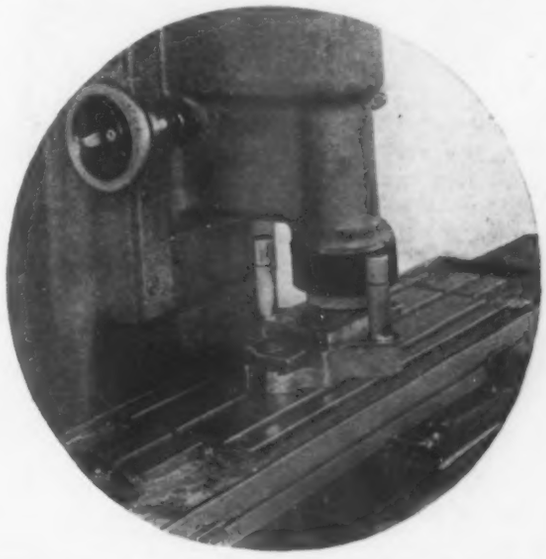
feed, 8 in. transverse feed, both automatic and 10 in. hand vertical adjustment. The wheel spindle is massive and carried on radio-thrust ball bearings and all other high speed shafts are likewise carried on ball bearings. Wheels up to 5 in. diameter can be used. The adjustment of the wheel head is by means of a screw which is actuated by a worm and wheel. Two hand wheels are provided, one for fine feed graduated to 0.00025 in., and one for rapid movements with an acceleration of 3 to 1. The gear case for the operating table and cross feed is a self-contained unit in which the gears and clutches run in a bath f oil. The machine is furnished with counter-shaft or concealed motor drive. All belts are enclosed and exposed moving parts safeguarded.

Some Improvement in North Pacific Territory

SEATTLE, Feb. 15.—There has been some improvement in the business outlook in the North Pacific Coast territory through the increasing demand for heavy duty machinery, farm implements and logging and mill machinery and tools. Outside steel mills are reported to be pushing sales of sheets and plates here, but there is not much demand. Some few sheets are coming by water, and stocks on the whole are ample. The jobbing trade is expecting a fair demand for steel products for Alaska, but orders are coming in late. There is plenty of pipe, and prompt delivery even in three-quarters and halves is assured. Owing to resumption of cutting by the lumber mills jobbers expect a brisk movement of mill and logging machinery. Loggers are contracting for dinkey engines and tools for delivery April 1, which signifies that log cutting will begin around that date after a close down since the holidays that was almost 100 per cent.

The sale of heavy duty machinery, such as drill presses for garage work, is very active, and the bulk of the business is being done on a cash basis. Demonstrations have been made over the territory by representatives of Eastern manufacturers at the Y. M. C. A. schools and the mechanical science department of the public schools, and the effect is now showing on the order files of the jobbers.

The Northwest Trading Co. of this city has closed a contract on which it has been at work for two months with the city of Tientsin, China, for a steel drawbridge over the Pie Ho River, in the heart of the city. The



bridge will be 280 ft. long. The cost f.o.b. Seattle is $150,000, and a survey at Tientsin calls for $150,000 additional for erection and completion ready for traffic.

Need of Car-repairing Program

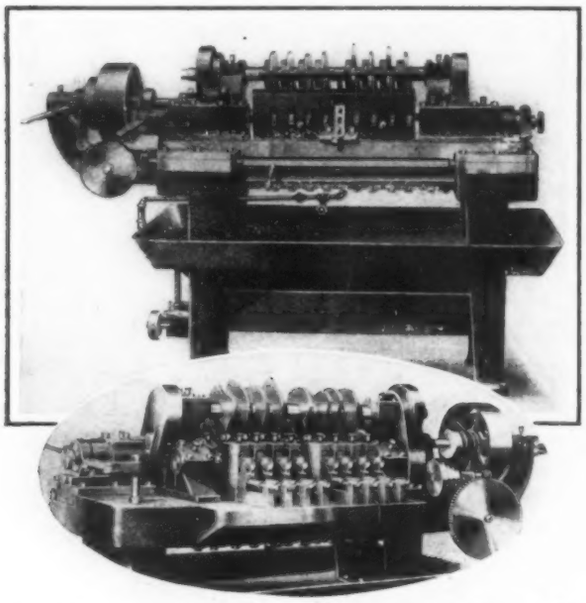
WASHINGTON, Feb. 22.—A definite car repairing program at this time is most necessary if the heavy transportation demands of the near future are to be satisfactorily met, according to W. L. Barnes, executive manager of the Car Service Division of the American Railway Association, in a semi-monthly summary of general transportation conditions. The lessening demand for open top cars is declared to be one of the prime factors in stimulating the return of such equipment to the home roads, and an unusually large percentage of this equipment is being returned in bad order, necessitating a period of rehabilitation. Mr. Barnes reports that a decided improvement has been noted during the past few weeks in the movement of open top cars under the car service rules. Requirements for box cars, it is pointed out, are being satisfactorily protected. Reports indicate improved demand for this equipment.

Freyn, Brassert & Co., Chicago, have been engaged as consulting engineers by the Wheeling Steel Corporation in the rebuilding and remodeling of No. 1 LaBelle furnace and of the Martins Ferry plant. At LaBelle the improvements will consist of enlargement of the furnace for augmented capacity, together with relining of the hot blast stoves and installation of a gas cleaning system complete with new uptakes, downcomers, dust catcher and Brassert washer. The Martins Ferry furnace plant improvements will consist of enlargement and reconstruction of the furnace proper, together with relining of the hot blast stoves and installation of a Brassert washer. Hand filling will be replaced by a modern top with skip filling.

Melling Cam Turning Lathe

The Melling cam turning lathe is a recent product of the Walcott Lathe Co., Jackson, Mich, and has been brought out as an improvement over the cam grinding machines used for rough grinding. Speed of operation, a minimum power requirement, turning out a number of cams at the one time are features specially emphasized. Little stock is left for finished grinding and the time of that operation is thus reduced and a uniform and maximum depth of hardened surface of each cam is said to be attained.

One of the main features of this machine is the use of a master cam which comprises a camshaft having cams of the precise form and dimensions desired and



The Melling Cam Turning Lathe, Front and Rear Views. The master cam is located on the rear of the machine, the tool control cam being on the topmost shaft. Each tool holder is mounted in a head or bracket of its own, for independent spacing

which will reproduce accurate cam shafts repeatedly. The cam to be turned is placed in the machine near the front or operating side. Chucks of the collet type securely hold and drive both ends and a quick adjusting steady rest on the center bearing serves to prevent the shaft from springing away from the cutting tools. There is a cutting tool for each cam and each cutting tool moves forward and backward while turning the lobed part and dwells while turning the concentric part of the cam. The tool also has a tilting motion while cutting the sides of the lobe, in order that its clearance and top rake will at all times be the same.

The reciprocating motion of the tool is accomplished by the master cam, which is located on the back of the machine at the same level as the shaft to be turned. The two shafts revolve at the same speed, consequently the cams on the shaft being turned must be the same in outline and angular position as the master cams. The cutting tool is given the proper tilt while turning the eccentric part of its cam by being held in the short end of a bell crank lever. The long end of this bell crank lever carries a roller which engages with a "tool control" cam seen on the topmost shaft of the illustration. The outline of each of these cams is dependent on the shape of the corresponding one on the master cam shaft.

Suitable springs press the cutting tools up to their work while the cams themselves draw the cutting edges away, thus preventing "hogging-in." Each tool holder is mounted in a head or bracket of its own in order to permit spacing independently and in proper relation to the cams being turned. The turning tools are made from 5/16 in. square high speed steel tool bits and are set by micrometer gage in the holders. It is said that one set of bits will turn 8000 shafts as against 200 of any rough grinding wheel.

An entirely automatic feed makes this machine semi-automatic in character, the duties of the operator being merely to place the camshaft in the machine and clamp it in position. After throwing in the clutch lever and moving the work table to its rough turning position, all further operations are automatic. The automatic feed movements are then as follows: The work table moves lengthwise causing the roughing cut to be taken across the face of the cam, then returns to its first longitudinal position, feeds the work up closer to the cutting tools when the finishing cut is taken on its second forward travel. When the finishing cut is completed, the work table backs slightly away from the cutting tools, returns to its original position and the machine stopped by automatically throwing out the friction clutch. The operator then removes the finished shaft from the machine.

It is said that the time required to turn one cam shaft is 2 min., from floor to floor, and that with all delays considered 25 shafts per hour may be produced. It is said further that the power used in turning is only 25 per cent of that used in rough grinding while production in the operation of finish grinding is increased 20 per cent because of the cams being more nearly to size and shape and also more accurately spaced in their regular angular position around the shaft. The shaft being turned is run at 140 to 200 r.p.m. and the feed approximately 0.008 in. per revolution. About 3½ hp. is consumed in operation, a 5-hp. motor being sufficient in all cases. The drive pulley is 14 in. in diameter and a 4 in. double belt is used.

Lake Superior Iron Ore Shipments

Shipments of iron ore from the Lake Superior district in 1920, as shown by statistics compiled by the *Iron Trade Review*, were 11,863,826 tons greater than that in 1919, but 2,425,695 less than in 1918.

Lake shipments in 1920 totaled 58,527,226, an increase of 11,349,831 over 1919, and rail shipments amounted to 1,883,251, an increase of 513,995.

Comparative statements follow:

Shipments by Port and All Rail, Gross Tons

	1920	1919	1918
Escanaba	7,361,070	4,963,358	6,774,969
Marquette	3,415,108	2,132,935	3,457,054
Ashland	8,180,852	5,915,383	7,565,608
Two Harbors	9,278,464	6,424,545	8,723,472
Superior	14,812,398	10,919,965	14,068,341
Duluth	15,479,334	16,821,209	20,567,288
Total by lake	58,527,226	47,177,395	61,156,732
Total by rail	1,883,251	1,369,256	1,679,440
Total	60,410,477	48,546,651	62,836,172

Comparative Shipments by Ranges, 1920-1919

	1920	1919	Increase
Mesabi	37,149,277	31,997,699	5,151,578
Menominee	6,562,106	4,442,868	2,119,238
Gogebic	8,763,332	6,230,839	2,532,493
Marquette	4,608,323	2,992,212	1,616,111
Vermillion	1,007,435	929,049	78,386
Cuyuna	2,190,433	1,861,165	329,268
Mayville and Baraboo	129,571	92,819	36,752
Totals	60,410,477	48,546,651	11,863,826
By lake	58,527,226	47,177,395	11,349,831
By rail	1,883,251	1,369,256	513,995

Helping the Patent Office

Announcing its determination to enter upon a comprehensive program looking to the reorganization of federal government departments, the American Engineering Council has started upon a determined effort to improve conditions in the Patent Office. The council has joined with the National Association of Manufacturers, the American Patent Law Association, the American Chemical Society and the National Research Council in a campaign to bring about important reforms in the Patent Office, where conditions are reported such as to menace seriously American industry and invention.

Among the features under attack are the number and compensation of patent examiners, whose ranks have been seriously depleted by the higher inducements offered by manufacturing interests. As it is usually the most progressive of the examiners and assistants who thus move on, the effect on the office is said to be deplorable. Other matters being urged include reciprocal patent relations with European countries, which were largely interrupted during the war period.

Future of the Machine Tool Business

Buyer Promised Little Money Advantage by Waiting, and Burden of Stabilizing Business Placed at Door of Federal Reserve Board

BY FORREST E. CARDULLO*

THE writer has been asked to present in a brief way his opinions regarding the effect of present economic conditions on the machine tool business with particular attention to the probable trend of prices in the immediate future. Unfortunately, I am unable to form a definite opinion on this subject. Our prices ought not to fall, and if the manufacturers can prevent it, they will not fall. However, the prices of machine tools depend on matters that are beyond the control of the manufacturers, and, before one can venture an opinion on the subject, he must consider the possibilities of the general business situation.

What Price Declines May Occur

From the standpoint of the machine tool trade alone, we can expect price reductions only in the case of two classes of tools. The first class comprises special tools of limited application and unique design, which, because of their unusual features, are of extraordinary value in particular jobs. Hitherto, these tools have not been sold on a competitive basis. Their price depended on their value to the purchaser, as compared with the standard tools which they replaced, not on the cost of production. We may expect lower prices on some of these tools in an effort to popularize them and extend their use. They will still be sold at a relatively high price as compared with standard tools of the same cost of production.

The second class comprises tools of inferior design and cheap construction which have sold at good prices, because of the impossibility of securing deliveries from reputable firms. Such tools will now be sold in competiton with reputable second hand tools, and their makers will be obliged to cut prices or go out of business.

In the case of reputable tools of standard design, no price reductions should be expected.

In the first place, machine tool builders have always operated on an exceedingly small margin of profit. Prior to 1915, there were very few builders whose annual profits exceeded 6 per cent on the value of their plant and equipment. For many reasons the business has always been a keenly competitive one. Practically all users of machine tools have shops capable of building the simpler forms of such tools. The technical skill and mechanical knowledge necessary in the business is not the monopoly of any person, firm or region. The field is attractive to many men of mechanical inclination. The products are widely advertised, fairly well standardized and easily compared. They are usually sold to people who have a thorough knowledge of their design, materials, workmanship and general excellence, and they are readily transported from one end of the country to the other. As a result of this, machine tools have always been built and sold on a very close margin, particularly in the case of standard tools not containing patent features of unusual merit and value.

While the prices of machine tools have risen within the past six years, this rise has not been proportional to that of most materials and products, particularly if account be taken of the many improvements in design affecting the convenience, accuracy, durability and productiveness of these tools. During the period preceding the introduction of high-speed steel, machine tools of all kinds underwent a long period of evolution in which was achieved the utmost simplicity and cheapness of construction, consistent with satisfactory performance. It is impossible to improve machine tools in any particular without adding materially to their cost. Such improvements are continually demanded by users and are advisable because of the saving which they effect and the advantages they confer.

We would, therefore, expect machine tools to have increased radically in price during the past twenty years even though there were no increase in the cost of labor and materials. The average machine tool of the present day successfully performs from five to twenty times the work which such a tool was called upon to perform twenty years ago, and performs it with much greater accuracy and in a much more satisfactory manner. While much of this is due to improvements in tool steels, a large part of it is due to improvements in the design and construction of the tools themselves, which greatly increases their cost of manufacture. The manufacturer has, therefore, every right to demand a higher price for his tools than he received in the pre-war period, for

1—His labor and material cost practically twice as much as they did then
2—His tools are heavier, more rigid and powerful and constructed of better materials than they were then
3—His tools will give from five to twenty times the service that they did then
4—His investment in plant and equipment must be greater in value; he must earn a higher rate of interest on this investment; he must pay largely increased taxes, and his fixed charges and overhead have soared almost out of sight.

I do not claim that the machine tool builders were losing money in 1920. Notwithstanding rising costs, they found themselves fairly prosperous for several reasons. In the first place, their plants were continuously busy at capacity. They lowered their production costs by adapting to their own use the improvements which they had developed for their customers. They were able to manufacture in larger lots than ever before. Their labor did not fall off in efficiency to the same degree as labor in other lines. They were not obliged to undertake the construction of machines having special features in order to secure business, a practice which has always been a fruitful source of loss. They were making a fair profit, but this profit was one which, in most other lines of business, would have been considered very modest, even before the war. The machine tool builder has been receiving a square deal and no more.

Few Wage and Other Cost Reductions

If we investigate the possibility of reducing costs of production we find them nil. Corn, rubber and sugar have fallen notably in price, but these articles are not used to any great extent in our business. Recession in the prices of coal, pig iron and steel have been small, and labor is as high as ever. Granted that there may be a drop in materials, it will certainly be counterbalanced by the higher unit overhead on a diminished

*Chief engineer of an old and well established machine tool company.

volume of sales, for no one expects the machine tool trade during the next year to maintain the volume of business experienced during 1920.

In the matter of labor, it may be pointed out that while our labor increased greatly in price, it did not increase in price and decrease in efficiency to the same extent as labor in many other branches of the mechanical trades. Falling wages in these trades are no warrant for immediate wage reductions in our business. If we discharge our entire force and hire new hands, we would have to hire less efficient men at the market, and that does not mean the market to-day, but the market in the spring after business begins to pick up again. From the wage standpoint, we are in an entirely different position from the clothing, the automobile and the rubber industries. It is impossible to expect any notable reduction in wages in the machine tool trade till there has been a marked fall in retail prices and in the general level of wages. Nor is it fair to expect workmen to accept a wage reduction unless such a reduction will bring them reasonably steady work. Giving the industry a square deal means giving a square deal to labor and owner alike.

A reduction in prices in any industry is justified only when profits are excessive, or when the reduction will bring about increased business.

I see no evidence that increased business would result from lower prices of machine tools. Tools are bought because they are needed and not because they are cheap. An old lathe is replaced by a new one, not because the price dropped $400 but because the new tool produces $400 worth more of work in a year. When business is good, tools are in demand, and the demand depends primarily on the value of the tool as a producer, not on its price. When business is poor, you can't stimulate the demand by price concessions, any more than you can stimulate the demand for coffins by holding a bargain sale.

The recent experiences of the automobile and independent steel industries is ample evidence that price cutting will not produce business. If business is good, the machine tool business will be good without any cut in prices. The market is not saturated, nor anywhere near saturated, except in the cheaper lines.

Many manufacturers have turned back their profits into development work which they felt was long needed, but which for many years they lacked first the money, and afterward the time, to engage in. New and improved designs are appearing each month. They are going to replace tools not yet worn out, because they can give superior service and produce work at a lower cost. Fair prices mean more development work, better tools and more profits for the purchaser. Low prices mean a stagnating industry, inferior tools and higher costs for machine work in all industries.

Limited Guarantees Against Price Declines

In consequence of all this, you will find an invincible determination among reputable machine tool builders to maintain prices at the present level. They have nothing to gain and everything to lose by price cutting. In the past six years they have struggled out of the mire of bankruptcy, and they do not propose to fall in again if they can help it. Most of them will go out of business before they will go back to the conditions of 1913-14. The best they are willing to do is to guarantee prices for a period of six months from quotation, and to agree to refund to the purchaser the difference between the price paid and any lower price quoted during the guarantee period. There will be no price cutting until such price cutting will produce profitable business, or until their resources are gone, and they have to accept business at a loss in order to avoid a greater loss.

In common with other business men machine tool builders believe the worst is over and there will shortly be a revival of business. The conclusion is not based on an optimistic temperament, but on a very solid array of hard facts. They know that buyers who delay needed purchases in order to obtain lower prices are going to lose more by depriving themselves of new and efficient tools than they will gain by the few dollars they save. The buyer knows, and they know he knows, that if there is a revival of business, his delay may cost him dear by leaving him short of equipment when he needs it in a great hurry. The thing resolves itself into a poker game, with the machine tool builder holding a pat hand.

From the best information I have, I believe the reputable machine tool builders can hold on for a year or more without cutting prices or exhausting their resources. You may draw your own conclusions as to whether the machine tool builder is going to let the buyer bluff him out. However, business conditions may follow an erratic and unexpected course, and upset these calculations.

Federal Reserve Board Controls Business

The future course of business lies in the hands of the Federal Reserve Board. The board has more real power than is exerted by any other body of men anywhere in the world. If I knew what they were going to do for the next two years, I could tell you what would happen in any business whose success was not immediately contingent on the weather. They have absolute control of credit, money and prices. The present period of business depression is due in part to the labor disturbances of the spring and summer of 1920, but it is due in still greater measure to the efforts of the Federal Reserve Board to deflate our currency, or in other words, to increase the ratio of the gold reserve to the total of outstanding Federal Reserve notes. The curtailment of credit necessary to accomplish this feat hindered production and forced down prices, first of stocks, the values of which were grossly inflated, and afterward of commodities, beginning with those whose prices were relatively the highest, such as rubber and sugar.

Now it does not need a professor of economics to foresee that falling prices spell hard times, a diminished volume of business, unemployment and national inefficency. The evils inherent in rising prices, profiteering, extravagance, speculation, social unrest, labor troubles, inefficiency arising out of the continuous effort to readjust business and industry to the stress and change of circumstances, and apprehension over the inevitable reaction, are equally to be avoided. It is therefore the duty of the Federal Reserve Board to maintain the general level of prices as nearly constant as possible.

The Board's Job in Stabilizing Prices

The effective and powerful instruments which the board used in order to accomplish this deflation were propaganda and the rediscount rate. They preached "restriction of credit," and "lower prices," and "a return to normal" early and late, and then they put on the screws by raising the rediscount rate. If these same instruments had been used for the purpose of stabilizing prices, we would now be enjoying a period of normal prosperity.

To bring about an immediate return of normal conditions, the Federal Reserve Board has only to announce its determination to maintain the present level of prices and that any further drop in the general level of prices will cause the rediscount rate automatically to fall, while any increase in the price level will cause it to rise. For example, if the present level of commodity prices as shown by Dun's index number, or that of the United States Department of Labor, be taken at 100 per cent, and the rediscount rate is 6 per cent, each 1 per cent increase or decrease of the index num-

ber may be made to cause a ¼ per cent increase or decrease of the rediscount rate. If prices went up 10 per cent, the rediscount rate would rise to 8½ per cent. If prices fell 5 per cent from their present level, the rediscount rate would fall to 4¾ per cent. Under these conditions prices would very gradually fall from 1 to 2 per cent a year. until the rediscount rate finally stabilized itself at about 4 per cent.

It may be objected that the emission of the quantity of Federal Reserve notes necessary to accomplish this would disturb the gold standard. The answer is that we are not now on a gold basis, and will not be until the gold reserve equals the total of outstanding paper money. The fact that the Federal Reserve Board is able to redeem notes in gold on demand does not put us on a gold basis. So long as the Federal Reserve Board does not issue enough paper money to force prices up, they will be able to redeem their notes in gold on demand, unless the demand for gold in the arts calls for the combined annual production and importation, or we again become a debtor nation while the currency of our creditors is more nearly on a gold basis than ours. Such a contingency cannot occur for at least forty years.

It may be further objected that such an arrangement would interfere with foreign commerce. As a matter of fact, it would facilitate such commerce. It could have no effect in the case of goods bought or sold for cash. The movement of goods in foreign commerce is essentially a process of exchange of commodities, and depends on relative prices. Goods move from the place where they are relatively cheap to the place where they are relatively high. In the case of long term credits, both parties will find it preferable to deal in American and not in foreign funds, unless one of the parties desires to introduce an element of speculation into the transaction. By giving his obligation in terms of American funds, the foreign buyer automatically insures himself against loss through falling prices in his own country. Such a financial system would give America a great advantage over her competitors in foreign commerce.

However, this is an article on machine tools, not foreign trade. To get back to my subject, there will be no reduction in machine tool prices *unless the Federal Reserve Board forces lower prices.*

Business will be bad

If the Federal Reserve Board continues its policy of deflation.

Business will return to normal and the machine tool business will be good

If the Federal Reserve Board will definitely adopt the policy of stabilizing prices.

Am I putting too much on the shoulders of the Federal Reserve Board? I think not. Our prosperity depends on the following elements:

1—Our natural resources, the products of our fields, forests and mines
2—The character, industry and intelligence of our population
3—The degree to which we apply the developments of science and the useful arts to the production of wealth
4—The nature of the financial system which we adopt in order to facilitate and encourage the production and exchange of commodities

Of these elements, the first is beyond our control. The second and third are subject only to slow and gradual change. In all three elements we rank the highest of any nation in the world, and higher than we have ever done in our previous history. In these three elements, we have a rock-bedded and enduring foundation for three sides of the edifice of national prosperity.

On the fourth side we have never provided anything except temporary and inadequate structures. The Federal Reserve Board has lately been engaged in pulling out some very flimsy piling, and we are engaged in the sad task of taking down a part of the beautiful but tottering superstructure. If the board continues to pull out more piling, we shall have to take down more prosperity, or the east wall will fall in and crush us.

In sublime ignorance of the elements of economics we claim workmen are starving because we raise too much food; they can't buy clothes because we have too much cotton and wool; our farmers are impoverished because the crops are so bountiful; our industries are paralyzed because they have produced so much wealth, we must export our surplus, but not take anything but gold in exchange; our foreign commerce is ruined because our products are in such demand that the rates of exchange have been forced to unheard of figures, and if we collect our debts we shall have a financial collapse. Such talk is madcap nonsense, yet, day by day we hear legislators, bankers, farmers and business men attributing our financial depression to these causes.

Our recurring financial depressions are due to the fact that the level of prices rises and falls like the tides of the sea. No enduring prosperity can be built upon such a foundation. The east wall of the edifice of national prosperity must be founded upon something fixed and immovable, upon a general price level independent of the available gold supply, independent of seasonal variation in the volume of business, independent of the condition of foreign trade, independent of the wishes and interests of speculators and gamblers on the one hand and of bankers on the other.

The answer is up to the Federal Reserve Board. It alone has the power to put in the foundation.

Lean Outlook for Foreign Trade

In conclusion, a word as to foreign trade. Europe at present and for many years to come has and will have a dearth of materials, and a surplus of labor. Europe will, therefore, import materials and export finished products; for example, taking in coal, iron and steel, and sending out tools of all kinds, but especially of standard types. Europe will secure food and manufacturing materials from the United States, export finished products to Asia, Africa and South America, and these in turn will export their products to the United States, completing the cycle, and settling the debt. Europe will export because she must in order to live.

Since Europe is an over-populated continent deficient in natural advantages, her very life, to say nothing of her wealth and prosperity, depend on her imports. Note that I say imports. In order to obtain the life giving, wealth producing materials which we take freely from our own forests, mines and fields, together with the tropical products which we also must import, she must give in exchange articles whose principal cost lies in the element of labor, and she must undersell us or starve. Europe must do an export business on a cut throat basis, and the part of wisdom is not to try to compete, except in those articles which, because of our natural advantages, we can produce profitably at an equal or lower price.

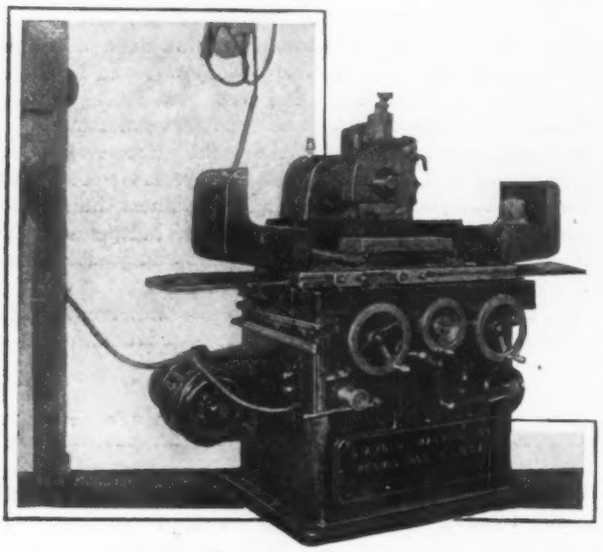
If we can make tools better or cheaper than Europe, after taking account of quality and the rate of exchange, we can maintain a profitable foreign trade. It is likely, however, that this trade will be small in volume, and will be principally in special tools, for as soon as the trade in any particular tool becomes really worth while, industrial conditions will force Europe to compete for the trade at prices which will not offer us a reasonable profit. I, therefore, do not believe that a large and prosperous export trade can be built up in the standard lines of machine tools.

New Diamond Surface Grinding Machine

Taking larger work than usual for its type, designed for finishing from the rough and equipped for positive and clean wet grinding, the new type C surface grinding machine recently brought out by the Diamond Machine Co., Providence, will grind pieces 10 in. wide, 24 in. long and 8 in. high, and is capable of taking a cut 0.234 in. deep and 1/16 in. wide, or a total cross section of 0.0150 sq. in. One reason for this unusual cut is in the elimination of the usual sliding tooth clutch for reversing. It is to be noted that removing stock as fast as cited is not to be recommended because of excessive wearing of the wheel, but a statement of its capability in this direction is offered as an indication of its construction.

The wheel spindle head is cast integral with the vertical column, the combined column and head, rather than the head alone, being adjustable up and down. This changed design is said to result in marked improvement in the quality of work produced. Ball thrust bearings are used on both the horizontal and adjusting screws.

Another improved feature is the placing of the main spindle bearing nearer than usual to the grinding wheel. This is a composite ball and plain bearing in-



volving a floating bushing adjacent to the ball races. The lubricant on both surfaces of this bushing seems to act like a dashpot. The objects aimed at are elimination of chatter and accurate finish to the work.

The rear end of the spindle has also a ball bearing and the driving pulley is placed near the rear bearing so that any vibration of the driving belt may not produce corresponding vibrations in the spindle. The spindle between bearings was made 2¼ in. in diameter to eliminate flexure vibrations.

The hand wheels for the three adjustments are placed symmetrical with reference to the center line of the machine, a small but important item of design. The left hand wheel for longitudinal travel moves the table about 2 in. per revolution; the center wheel moves the table transversely (in or out) 0.5 in. per revolution; and the right hand wheel raises or lowers the wheel head (with column) 0.1 in. per revolution. The rims of the center and right hand wheels have graduations for thousandths of an inch but they are so widely spaced that the operator can readily split the thousandths into tenths. The ways for all three directions of travel are guarded to prevent injury from abrasive dust or gritty water.

This machine is designed for motor drive, the motor being component with the machine itself, and not an added element. Provision is made for countershaft drive, however, if desired.

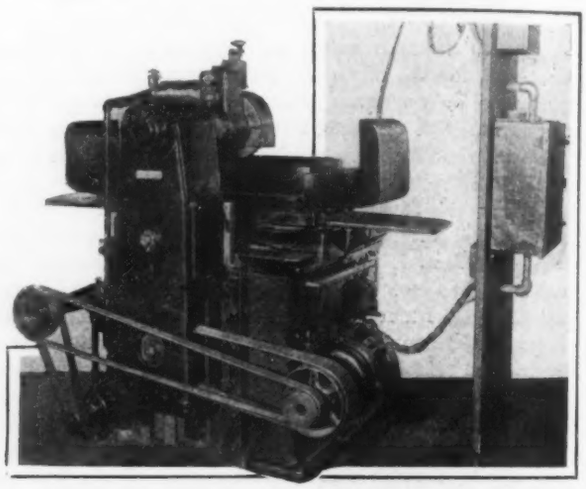
Consul Foster of the American Mission to Vienna has reported that the lack of raw materials has reduced the working capacity of the iron industry in Austria to 35 per cent of normal.

January Fabricated Steel Business

The amount of business put under contract in fabricated steel work in January was 32,000 tons, the lowest amount for the nine years for which there are records, except the first three months of 1919 in the dull period following the signing of the armistice. The statistics have been obtained from George E. Gifford, secretary of the Bridge Builders and Structural Society, New York, and indicate that last month's business engaged 18 per cent of the entire capacity of the bridge and structural shops of the country.

Will Buy Steel Tanks

WASHINGTON, Feb. 22.—Bids, to be opened on Feb. 25, have been asked by the Division of Supply and Sales, Emergency Fleet Corporation, for 12 55,000-



Rear View of the Diamond Type C Surface Grinding Machine Shows Elevating Composite Column and Head

bbl. steel tanks with conical steel roofs and supports. The tanks are to be in all respects equal to the Riter-Conley Co.'s standard 55,000-bbl. steel tank, 114 ft. 7 in. by 30 ft. 4 in. high, deliveries to be f.o.b. cars at manufacturers' plant. Bidders are asked to specify the earliest dates they can start and complete shipment. It is understood that the tanks are to be installed along the Atlantic coast for the storing of oil for Shipping Board vessels. Fabricators' estimates indicate that each of these tanks has a shipping weight of approximately 214 tons, making the total steel requirements a little more than 2500 tons, the great bulk of which will be sheared plates, ⅜ to 9/16 in. in thickness. Bids on tanks of this type made last year ranged from $22,000 each upward, depending upon the finish and details as to certain installations.

Competition of German Producers

WASHINGTON, Feb. 22.—The Czecho-Slovak iron industry is suffering from competition of German iron-producers, according to a report to the Bureau of Foreign and Domestic Commerce received from Assistant Trade Commissioner Donald L. Breed, Prague. Sweden is the chief source of the ore which Czecho-Slovak imports, while Germany buys mostly from France. Deliveries from Sweden can take place less than half the year, most of the shipments coming through the harbor of Libau. A higher railroad tariff in Czecho-Slovakia, as compared with that of Germany, tends to raise the cost of Czech-Slovak production above that of the German plants, and the higher prices paid by Czecho-Slovakia for coal further contributes to the unequal cost of production.

WASHINGTON, Feb. 22.—Award of 400 tons of plates for the Washington Navy Yard was made last week by the Bureau of Supplies and Accounts to the Carnegie Steel Co., at a price equivalent to 2.65c., base, Pittsburgh. Delivery in 15 days was promised by the company. As stated in THE IRON AGE of Feb. 10, bids of six companies were the same, 2.65c.

Uncertainty as to Wages in Coke Regions

Policy of Steel Corporation Is Perplexing to Independents—Operations of Frick Company Reduced to 70 Per Cent — Feeling Generally Optimistic

UNIONTOWN, PA., Feb. 22.—Retrenchment in operations on the part of the H. C. Frick Coke Co., United States Steel Corporation subsidiary, is the outstanding feature of the past week in the local bituminous field. Coke production of the company has dropped to about 70 per cent, compared with production of 85 to 90 per cent maintained for the past several months. Coal production is around 80 per cent, the drop here being less pronounced than in coke. In the Monongahela River district, or so-called Clairton feeding district of the company, the coal mines are operating at something more nearly approximating capacity, river shipments having, if anything, shown an increase.

No reason is assigned for the retrenchment. Most observers believe that the storage bins at the furnaces have been filled and that the retrenchment is approximately that of current needs of the Steel Corporation. The retrenchment is more pronounced in the northern district of the company's operations.

Independent operations in the region continue at the lowest ebb in many months, the bottom having been reached, it is believed. Best estimates place independent coke production in the region at around 20 per cent. Coal output is higher.

Independents are giving serious consideration to reductions in wage and operating costs with a view to resuming work. A number of informal meetings of the various interests have been held here during the past 10 days. The latest was the visit of a group of officials from Pittsburgh of one of the larger independent operations in the county, at which the matter of wages was one of the principal conversational topics. No decision was reached.

The Steel Corporation policy has resulted in an "upset" of calculations on the part of the independents. The corporation heretofore has led in wage revisions and in establishment of conditions generally in the field. Observers are discussing possible reasons affecting the Steel Corporation "no revision" policy, and there is now a decided tendency on the part of the leading independents to play a waiting game for a while longer to see what the next three or four weeks will bring forth from the Steel Corporation. In the event the present policy stands, it is generally believed that the independents will take the initial step in reducing operating and wage costs. Best opinion in the region is that pronounced improvement will be delayed in the general situation until around April 1, certainly not later than that date.

The independents are in an unusual position in an industrial depression. Heretofore it has frequently been necessary to operate, even at a loss, to meet maturing obligations, and with the hope that succeeding months would swing the balance to the favor of the operators. The past year or two have seen such profits as to put the independents in a financial condition to "wait it out" for a reasonable length of time. Workers, likewise, are in a generally favorable financial position, and as a result the depression in the region has caused scarcely more than a ripple in the general economic state of affairs.

There is a pronounced optimistic spirit in the region. The number of contract "inquirers" of the past fortnight have shown much more strength, and it is believed that some signatures will be placed "on the dotted line" in the next few weeks.

Employment in Metal Working Industry

Figures of the bureau of labor statistics of the United States Department of Labor for the month of January show that in 103 identical establishments the number of men on the payroll has fallen off from 143,062 in January, 1920, to 106,676 this year, a decrease of 25.4 per cent. The payroll for the half month has dropped from $10,130,780 last year to $8,011,217 this year, a decrease of 20.9 per cent. The average individual envelope, however, has increased. The figure last year was $70.80 and this year $75.10.

While the average pay as compared with a year ago has shown this increase, there has been a drop during the past month as shown by the comparison between December, 1920, and January, 1921. In this period 105 establishments reported a falling off in the number of men from 132,485 to 108,949 or 17.8 per cent. The corresponding reduction in payroll for the half month was from $10,564,361 to $8,127,446 or 23.1 per cent. The average pay in December was thus $79.70 as compared with $74.60 in January, a decrease of $5.10 or 6.4 per cent.

The report cites numerous instances where cuts were made in single establishments ranging as high as 25 per cent in some cases and as low as 2 per cent in others. In addition to this, however, lack of orders had caused the partial closing of many establishments, thus contributing largely to the decrease in average earnings per man.

The two other industries covered by the report which are in closest touch with the steel industry are automobiles and car building and repairing. The former shows a drop in number of men employed in 39 establishments from 73,673 to 26,044, or a decrease of almost two-thirds. The corresponding drop in the payroll was nearly as heavy as in the number of men. A slight improvement is shown in January over December, however, in 40 automobile plants, where the number of men employed has increased by 600 or 2.5 per cent. This was accompanied by a reduction in average pay per man of about 5 per cent.

In car building and repairing there has been a falling off in the number of men employed of 5.5 per cent since last January, but an increase of 9.6 per cent in the payroll for the half month. Compared with December, however, January shows a reduction of 12.4 per cent in the number of men and 20.2 per cent in half month's payroll, this representing a loss of 8.9 per cent in average pay.

Mr. Nutt Explains Wage Cut

James H. Nutt of Youngstown, Ohio, secretary of the Western Sheet and Tin Plate Manufacturers' Association, embracing mid-Western independent mills that sign the wage agreement with the Amalgamated Association of Iron, Steel and Tin Workers, points out that, while the tonnage rate for union sheet mill workers for the January-February period is a reduction of 19½ per cent on the base rate as compared with the November-December rate, it is a cut of only 9.3 per cent from the working price paid during November and December. The tonnage rate for the first two months of 1921 is based on a 5.15c. card, as compared with a card of 5.80c., which determined the wage rate for the last two months of 1920.

For instance, on No. 28 gage black sheets the base wage rate for members of a sheet mill crew, including the roller, heater, heater's helper, shearman, pair heater, rougher, catcher, matcher and doubler, is $11.822 per ton. This is the rate when the actual average invoiced selling price of Nos. 26, 27 and 28 gage plain sheet steel f. o. b. mill is $2.15 per 100 lb. The tonnage rate increases for each member of the crew 1½ per cent for each advance of 5c. per 100 lb. in the selling

price above the base of $2.15. When No. 28 sheets are selling at $5.80 per 100 lb., as disclosed at the examination in November, 1920, to fix the tonnage rate for November and December, the wage rate is, therefore, $24.76 per ton, or 109½ per cent above the base.

Similarly, the tonnage rate, based on an average selling price of $5.15 per 100 lb., as disclosed at the examination in January to establish the January-February rate, is figured at $22.46 a ton, which is 90 per cent above the base, or a reduction of 19½ per cent on the base. When compared, however, with the tonnage rate of $24.76 paid in November and December, it is a cut of only 9.3 per cent.

The wage reduction of 10 per cent, which became effective Feb. 1 for tonnage men employed by the American Sheet & Tin Plate Co., was in reality, therefore, greater in percentage than that sustained by workers in independent mills on Jan. 1.

Just what the ratio for March and April will be, as between the wage rate for such workers paid by the independents and the leading interest, remains to be seen. It is inevitable that the average card rate will decline probably as low as 4.35c. or more.

Wages and Rail Rates

WASHINGTON, Feb. 22.—With the decline in prices of many commodities, certain industries are asking the railroads to reduce rates, according to a statement issued last week by Thomas DeWitt Cuyler, chairman of the Association of Railway Executives, in connection with plans to consider the report from its labor committee as to the action to be taken in view of the present business situation.

"Such requests are a perfectly natural consequence of existing business conditions," he added, "and the railroads would reduce rates if they could possibly do so and continue to give the service the public requires and at the same time provide for future transportation needs, but rates cannot be reduced until the railroads are able effectively to reduce their costs of operation. That is the supreme problem now facing railroad managers."

Boston Building Trades Strike

Mayor Peters, Boston, has had several conferences with representatives of the contractors and labor of late in the hope of reaching a settlement of the building trades controversy in that city, but no progress has been made. Last week the mayor suggested that union wages in force at the time the strike was called be continued until May 1, and thereafter be reduced to a 90c. per hour basis, with certain other modifications. The parties to the controversy did not take kindly to this suggestion. He has, however, accomplished one thing. He has succeeded in getting both sides discussing the situation by themselves at the city hall, he being absent from such discussions. During the early stages of the strike such discussions could not be agreed upon.

All, however, are holding out, and indications are the affair will drag along for weeks. In the meantime no effort has been made to finish the construction of buildings in the process of erection when the workmen walked out. The action of the contractors in this respect has offered no excuse for picketing.

The move to reduce wages from $1 to 90c. per hour continues to spread, and has ceased to be a purely Massachusetts affair. Bridgeport, Conn., is the latest point of development. The master builders of that city have authorized a reduction of 20 per cent in the wage scale. Building operations throughout New England have fallen to a low level, as a result of the present controversy.

The Boston Society of Architects has adopted a resolution expressing the opinion of the body that no more unfortunate time could have been chosen for the strike of the mechanics in the building trades in Boston. Declaring that if there should be any change in mechanics' wages, it should have been in the direction of lower wages, and that no person needs two whole days of rest in seven, the resolution states the strike is an act contrary to public welfare, "because it is based on a demand for shorter hours per week and wartime wages."

The metal workers' union headquarters in Boston have been raided twice by the police, and in each instance many arrests made on charges of gaming. In the last raid 48 men were taken on such charges.

Stock Sale Plan for Employees

The National Machinery Co., Tiffin, Ohio, has just announced a stock sales plan for its employees which contains some original features that are provided for giving the workers a share in the company's profits. It has set aside for employees 2500 shares of the cumulative 7.2 per cent $100 par value preferred stock and 5000 shares of its no-par common stock, these being 20 per cent of the total issue of these securities. The two classes of stock will be sold to employees in blocks of one share of preferred to two shares of common stock. By this plan the employee is given an opportunity to place his savings in the preferred stock and a chance to make additional profits through his holdings in the common stock.

A stock sales plan for common stock has been adopted that is a compromise between selling this stock outright at a low price, thus making it possible for the holder to dispose of the stock to outside interests at higher prices should he leave the company's employ, and the plan of compelling the employee to return the stock should he leave its employ. Employees the first year, under the plan, will be required to pay a nominal installment price of $1 a share for the common stock, on which a value of $50 is placed. If an employee leaves the company and wishes to retain his common stock, he must pay $49 per share additional. However, at the end of each year's service the company will credit the employee with an amount equal to 10 per cent of the unpaid balance on the common stock, based on a $50 value, so that at the end of 10 years' service he will own the stock outright, for which he has actually paid only the original $1. Should he leave the company's service before the expiration of the 10-year period, he will be required to pay $49 per share for the stock, less 10 per cent for each full year he has been in the company's employ.

In the Field of Labor

In common with similar companies, the New London Ship & Engine Co., Groton, Conn., has reduced wages of short-time men 10 per cent, and long-time men 20 per cent, and has changed over from a four to a five-day shift in all departments.

The Bristol, Conn., common council has appropriated a sum of money to be loaned to unemployed persons in that city found deserving, without charge of interest, for a period of two years. The initial appropriation was $1,000, but no restriction is placed on the total amount to be loaned.

Sweeping injunctions restraining the ironmoulders' union and its agents from interfering with the conduct of the business of the Holyoke Machine Co., the Reed-Prentice Co. and the Whitcomb-Blaisdell Machine Tool Co., all of Worcester, Mass., have been issued by the Massachusetts superior court.

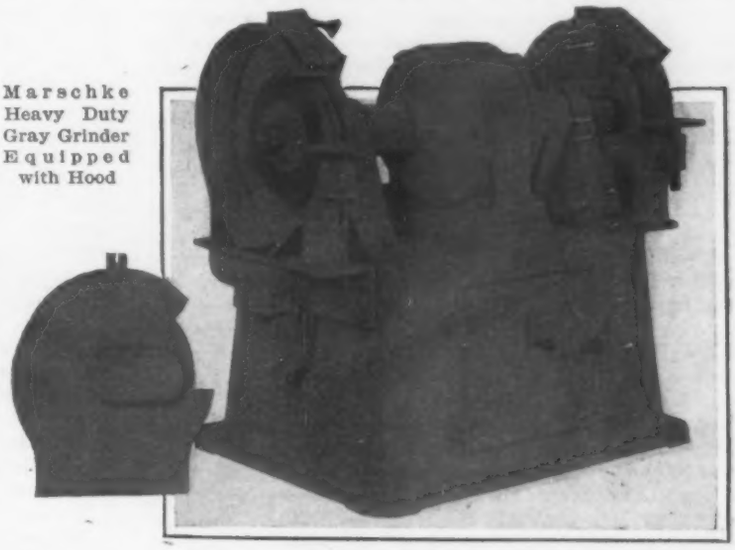
Of the total outstanding capitalization of Blaw-Knox Co., Pittsburgh, amounting to $3,417,825, $624,000 is held by employees of the company, according to a recent statement by Albert C. Lehman, president of the company.

The Associated Industries of Massachusetts has issued a report covering nearly 300 industrial plants in 35 cities and towns, which shows more plants running more hours per week as of Feb. 1, and employing more men and women than was the case Dec. 1, 1920, and that wage reductions between those two dates were smaller than generally supposed. The industrial improvement, however, is due largely to the comeback in textile and shoe lines. Since Feb. 1, some of the largest Massachusetts industrial plants have announced further wage reductions. It is only fair to state, however, employment has increased further since Feb. 1, in allied iron and steel industries.

New Heavy Duty Grinder

A heavy duty four-bearing, ball-bearing, dry grinding machine with 18 x 3 in. wheels has been added by the Marschke Mfg. Co., Indianapolis, to its existing line of motor driven grinders.

The motor is entirely enclosed and is furnished for alternating current, two or three-phase, 60 cycle, 220 or 440 volt, or for direct current at 110 or 220 volts. With the alternating current motor the weight of the machine is 2200 lb., while the direct current machine is given as 2300 lb. A Condit N-1 oil switch starter is regularly furnished. The base of the machine at the floor is 31½ x 45½ in. and the floor space required is 32 x 64 in. The arbor is 54 in. long and 1¾ in. in diameter where the wheels fit and 2 3/16 in. in diameter in the motor core. The height from the floor to center of the arbor is 34 in. The bearings in the motor are independent from the outboard bearings, the former being S. K. F. and the latter of the Hess-Bright type.



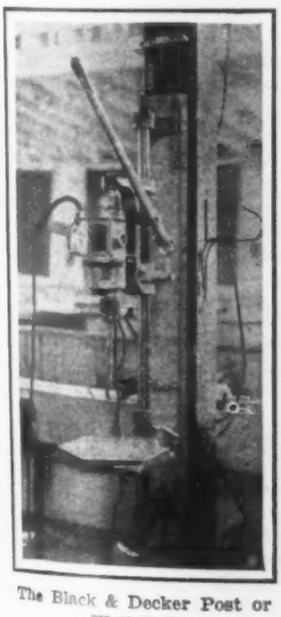
Marschke Heavy Duty Gray Grinder Equipped with Hood

The hood is adjustable by means of a handle conveniently located. As the hood recedes and the steady rest brought close to the wheel the spark plate adjusts itself automatically by means of a crank arrangement. The hood is furnished in gray or malleable iron. The hood support which is also the outer ell from the exhaust has an opening directly underneath the hood which serves as a cleanout and in the case of grinding brass the heavy substance is deflected, allowing only the dust to be taken through the exhaust.

The machine is furnished with or without an exhaust fan. In the former case the exhaust is mounted in the base, is equipped with S. K. F. ball bearings, and driven by a high speed chain. The entire apparatus is enclosed in a housing and kept free from dust and dirt. The starter is mounted on back of the large door in the base and opens with the door, permitting accessibility to the exhaust apparatus.

Combination Wall and Portable Drill

A wall or post drill designed to take the ⅜-in., ½-in., 9/16-in., ⅝-in. and ⅞-in. sizes of its portable electric drill is being brought out by the Black & Decker Mfg. Co., Baltimore. The electric drill can be detached in a few seconds for portable work and is easily attached again.



The Black & Decker Post or Wall Drill

The vertical column is a solid steel shaft 1 7/16 in. in diameter and 46 in. long. It is clamped to the wall or post by means of heavy brackets at top and bottom. The bracket carrying the electric drill can be raised, lowered or swung around the vertical column and is secured in any position desired by a split collar and clamping screw. A strong helical spring returns the drill to the high position when the feed lever is released. The table can also be raised, lowered or swung around on the vertical column and has six holes tapped in it for the ½-in. studs used to clamp the work in place. An extra long feed lever gives a feed ratio of 6 to 1. The vertical adjustment of the drill is 25¼ in., the horizontal adjustment 180 deg. The drilling radius is 7 in. and the feed (vertical travel of drill when operated by feed lever) is 4½ in.

STEEL CORPORATION CREDIT

Foreigners to Be Helped to Extent of $20,000,000, Says Chairman Gary

Judge Elbert H. Gary, chairman of the United States Steel Corporation, said a few days ago to newspaper men that, so far as he knew, the cuts in steel prices announced thus far have not in any way affected orders. In regard to foreign competition, Judge Gary said he believed there had been little competition from abroad. He added that the export business was good and, all things considered, the foreign trade of the corporation satisfactory.

Concerning foreign trade finance corporations, Judge Gary said that he was in favor of anything that would stimulate the purchase of goods. "It seems to me," he said, "that private enterprise can and should assist foreigners in handling their goods by extending suitable credits to them. The Steel Corporation had voted to extend credits to foreigners of $20,000,000."

"I do not know exactly to what countries these credits were granted," he continued. "The corporation is doing a good business with Canada, Mexico, China, Japan and some of the South American republics. In fact, the corporation manages to do a good export business at all times. Some of it is done on a credit basis, but most of it in the regular way. In regard to foreign competition after the European countries have rehabilitated themselves, it will largely depend upon wage rates. If the rates abroad should be as near to our rates as they are at the present time, I should not think this country need fear any serious or harmful competition. The principal advantage which foreigners had over producers of the United States heretofore was found in their very low rate of wages. If they should go back to those low rates, then there ought to be a reasonable protective tariff.

"I doubt if any of the steel manufacturers who have cut their prices have increased their sales to any material extent. On the contrary, I think they have been the means of decreasing the total of sales. Of course, a manufacturer may sell a small quantity of goods by making a material cut; but he will find by the end of the year he has not gained anything."

"National Safety Code for the Protection of the Head and Eyes of Industrial Workers" is the subject of Handbook No. 2, published by the Bureau of Standards, Washington. It is a set of rules designed to give mechanical and optical protection to the eyes of workers in certain occupations, including metal-working, which involve eye hazard. The rules are accompanied by a discussion intended to assist in their interpretation and application and to show the reasons for including some of them in the text. The booklet consists of 64 pages and is sold for a small fee by the superintendent of documents, Government Printing Office.

VIGOROUS DISSENT

Senator Gay Objects to Government Control of Prices in Peace Time

WASHINGTON, Feb. 22.—Sharp dissent from the majority recommendation of the select Committee on Reconstruction and Production, which urged regulation and licensing of the coal industry, is taken in a minority report submitted by Senator Gay, Democrat, of Louisiana. The Louisiana senator said the majority was "endeavoring to put through hurriedly a great departure in industrial control with the most superficial investigation," pointing out that the installation of a license system for business concerns dealing in coal would set a precedent for legislation in other industries. He said that he could not agree to the "provisions for sweeping and drastic Federal regulation of the coal industry and interference with the ordinary process of business in connection with that industry."

Expressing his belief that there is not anything in the present or prospective condition of the coal industry to warrant any such measures, Senator Gay said he doubted seriously whether Congress has any such authority to control and regulate business as is attempted.

"I certainly am not aware of any peace-time authority which Congress has to determine prices of commodities or to authorize the executive department to fix and regulate prices of commodities or margins of profit whenever an emergency shall be declared to exist," the report states. "There is no telling what interpretation will be placed upon the term 'emergency.' There would be a great temptation for consumers—particularly large consumers—to interpret the term very liberally, perhaps, at any time that the price did not suit them. If adopted I believe it would prove the entering wedge for a widespread system of attempted Federal regulation of the lumber, wheat, cotton, oil, metal mining, iron and steel manufacturing, and other industries, which is repugnant to every principle of American institutions since the foundation of our government."

"I do not agree with some theorists who regard it necessary that we shall perpetuate regulations made necessary by the greatest war in history," the report continues. "Regulation of price is so intricate and so ramified that an effort at its control undertakes a task of unparalleled magnitude. The wisest of administrators cannot prevent widespread iniquities.

"I oppose the licensing feature of the bill, which is one of the outgrowths of the committee's activities. This legislation will establish a precedent. I do not want the business man of America to be forced to come to Washington, hat in hand, to prove to some bureau employee or official that he has been carrying out the technical anl voluminous regulations which likely will be promulgated if this legislation should be placed upon our statute books."

Jones & Laughlin Road a Common Carrier

WASHINGTON, Feb. 22.—The Aliquippa & Southern Railroad, owned by the Jones & Laughlin Steel Co., Pittsburgh, is a common carrier and as such is entitled to receive divisions out of joint rates in connection with the Pittsburgh & Lake Erie on the basis of rates to and from Woodlawn, Pa., according to a decision of the Interstate Commerce Commission, handed down last Saturday. The opinion was prepared by Commissioner Meyer. Rates charged shippers over the industrial line were held to be unreasonable and reparation was ordered for them, effective from Aug. 9, 1918, on intrastate and from Feb. 1, 1919, on interstate rates. This will apply to all traffic except iron ore, slag, ashes and refuse for wasting, or movements in connection with the Pittsburgh & Lake Erie at switching rates of 20c. per ton or less for the complaining steel company or the intervenor, the Rodgers Sand Co. The specific division of joint rates was not determined because the case was brought by the steel company as the shipper, while the division will be arranged with its railroad.

With respect to rates on slag and other material to be "wasted," the commission said it was not convinced that the same rates to and from Woodlawn should be required and it took a similar position as to freight moved at 20 cents per ton or less. This will give the Pittsburgh & Lake Erie the right to decline making an arrangement with the Aliquippa & Southern that will afford the steel company the same rates that would apply were shipments direct from the Pittsburgh & Lake Erie.

Concentrated Attacks on Industrial Hazards

In 1921 the members of the National Safety Council under a new plan will attempt to concentrate on a different hazard each month. The attacks are to be carried on simultaneously in all the plants operated by the members of the council except where special local conditions warrant alteration of the plan.

In January in approximately 8000 industrial plants, mines, railroads and other public utilities throughout the country a special campaign was conducted against ladder accidents. It is estimated that 100 persons are killed in ladder accidents each year. The February campaign, now under way, is against neglect of minor injuries and infections arising therefrom. Campaigns are announced for the other ten months against the following hazards:

March, unsafe clothing.
April, horse play.
May, hand tool hazards.
June, standing or sitting in dangerous places.
July, machinery hazards.
August, inattention.
September, fire.
October, health hazards.
November, careless handling of materials.
December, eye injuries.

Ruling on Wire Rod Rate

WASHINGTON, Feb. 22.—Passing upon a complaint made by E. H. Edwards, South San Francisco, Cal., producer and seller of wire, wire rope, and wire netting, the Interstate Commerce Commission has handed down a decision holding that the rate on wire rods of No. 8 gage or heavier from Harriet, N. Y., Woodlawn, Pa., and other points in transcontinental group B is not unreasonable but is unduly prejudicial. It was ruled that it should not be more than 90 per cent of the rate on manufactured galvanized wire, wire netting and wire rope. At present the rate on wire rods and the finished lines is the same, or $1.25 per 100 lb. The commission says that the record clearly discloses that the interest of the complainant lies chiefly in the relationship of the rates and that generally the rates on raw materials should be somewhat lower than rates on products manufactured therefrom. The decision will compel the carriers to establish the differential denoted between rates on wire rods and finished wire between the points indicated. At present they are the same from groups A, B, C and D but from groups F, G. and H the rates on wire rods are about 88 per cent of those on manufactured wire, and 94 per cent from group E.

Many Surplus Cars

WASHINGTON, Feb. 22.—American railroads on Feb. 8 had a surplus of 358,065 cars, according to the report of the car service section of the American Railroad Association. This compares with an actual shortage of 150,000 cars at the same time last year. The surplus is piling up at the rate of 25,000 cars a week, the association's announcement said. Of the existing surplus, 175,724 were box cars, 122,789 coal cars, 87,832 gondolas, 11,764 flat cars and 6,343 coke cars. The surplus by districts was as follows: Eastern, 75,640; Allegheny, 85,916; Pocahontas, 19,095; Southern, 50,306; Northwestern, 40,964; Central Western, 57,462; Southwestern, 28,682.

The Monitor Stove Co., Cincinnati, is contemplating the erection of a steel and concrete warehouse on its property in the West End. The building will be 180 x 165 ft., and it is understood the plans will be prepared and the work done by the company's own engineers.

BRICK PRICES REDUCED

Dullness of Steel Market Reflected in Decreased Demand for Refractories

PITTSBURGH, Feb. 21.—The low rate of iron and steel plant operations finds very close reflection in the demand for refractories, which, if such is possible, is even duller than it has been during the past few weeks. Even the Steel Corporation subsidiaries, which hitherto have been specifying fully against their orders, now are only taking about 75 per cent of their requirements. Independent furnace and steel works activities are on a declining scale and demands from these sources lately have been practically nil. There has been further curtailment of refractory plant operations, which now do not average more than 40 per cent of capacity. Illustrative of the light demand it might be stated that even on this rate of production a number of manufacturers are obliged to stock some goods.

Prices of fire clay and silica brick show little change. Missouri makers of fire clay brick recently have cut prices about $5 per 1000 in an effort to stimulate business, while less than $40 per 1000 recently has been done on high duty Kentucky fire clay brick. There has been a cut of $10 per ton in magnesite brick, not that the raw materials are any more plenty or cheaper, but because manufacturers have rather heavy stocks which they have been somewhat anxious to move. Chrome brick are down to $75 per net ton as compared with the recent range of $80 to $90, this reduction also being prompted by a desire for business.

We quote per 1000 f.o.b. works:

Fire Clay:	High Duty	Moderate Duty
Pennsylvania	$40.00 to $50.00	$35.00 to $40.00
Ohio	40.00 to 45.00	30.00 to 35.00
Kentucky	38.00 to 45.00	35.00 to 38.00
Illinois	40.00 to 50.00	30.00 to 40.00
Missouri	45.00 to 50.00	35.00 to 40.00
Silica Brick:		
Pennsylvania	45.00 to 50.00	
Chicago	55.00	
Birmingham	56.00 to 60.00	
Magnesite Brick:		
Standard size, per net ton	90.00	
Chrome Brick:		
Standard size, per net ton	75.00	

Taylor Society at Springfield

The interference of the unstabilized dollar with efficient management, sales quotas, the development of the function of personnel administration and first moves in the development of scientific management in a plant are the chief topics to be considered at the winter meeting of the Taylor Society at Springfield, Mass., Feb. 24 to 26. Sessions will be held in the Municipal Auditorium and the headquarters of the society will be maintained at the Hotel Kimball. The program follows:

Thursday Evening, Feb. 24, 8 p. m.

Address: How an Unstabilized Dollar Interferes with Efficient Management, Irving Fisher, professor of political economy, Yale University. Discussions (15 minutes each): Roger Babson, Babson Statistical Organization, Wellesley Hills, Mass.; James O. McKinsey, Frazer & Torbet, New York; Walter W. Stewart, professor of political economy, Amherst College; general discussion from the floor (five minutes each) and questions.

Friday Forenoon, Feb. 25, 10 a. m.

C. K. Woodbridge, Dictaphone Co., New York, presiding.

Report of the Committee on Sales Quotas, a committee appointed at the sales executives' conference of June 25, 1920, consisting of Charles P. Staubach, Burroughs Adding Machine Co., Newark, N. J., chairman; M. S. Eylar, Elliott Fisher Co., Harrisburg, Pa.; R. N. Fellows, Addressograph Co., Chicago; C. E. Steffey, National Cash Register Co., Dayton, Ohio; J. R. Worden, Frederick Stearns & Co., Detroit.

Friday Afternoon, Feb. 25, 2:30 p. m.

H. S. Person, managing director Taylor Society, presiding.

Discussion of the Report of the Forenoon (15 minutes each): A. E. Belisle, the Bassick Co., Bridgeport, Conn.; D. J. Hoskins, Hood Rubber Products Co., Watertown, Mass.; Harry R. Wellman, professor of marketing, Amos Tuck School; C. K. Woodbridge, Dictaphone Co., New York.

General Discussion from the Floor (5 minutes each) and Questions.

Friday Evening, Feb. 25, 8 p. m.

Percy O. Dorr, first vice-president Springfield Chamber of Commerce, presiding.

Address: The Development of Our Conception of the Function of Personnel Administration: A Review of the Past Ten Years, Meyer Bloomfield, Bloomfield & Bloomfield, Boston.

Discussions (10 minutes each): William F. Dobbins, fourth vice-president Metropolitan Life Insurance Co., New York; Boyd Fisher, Lockwood, Greene & Co., Boston; W. W. Hart, White Motor Co., Cleveland; L. B. Hopkins, the Scott Co., Philadelphia; Ordway Tead, New York; Mrs. Jane Comey Williams, the Plimpton Press, Norwood, Mass.; Robert B. Wolf, New York.

General Discussions from the Floor (5 minutes each) and Questions.

Saturday Forenoon, Feb. 26

Round Table Conference on First Moves in the Development of Scientific management in a Plant.

9:30 a. m.—Conference 1: First Moves with Respect to Stores. Presiding, A. E. Barter, the Plimpton Press, Norwood, Mass.; discussion led by Morris L. Cooke, Philadelphia; Henry H. Farquhar, Cambridge, Mass., and Henry W. Shelton, Philadelphia.

9:30 a. m.—Conference 2: First Moves with Respect to the Planning Room. Presiding, W. L. Carter, Nashua Gummed & Coated Paper Co., Nashua, N. H.; discussion led by H. K. Hathaway, Philadelphia; Wallace Clark, New York; D. J. Walsh, Jr., Boston, and J. A. Carlin, Philadelphia.

11:30 a. m.—Conference 3: First Moves with Respect to Layout and Standardization of Equipment. Presiding, A. B. Rich, Dennison Mfg. Co., Framingham, Mass.; discussion led by John Williams, New York; Carl G. Barth, Philadelphia; Robert T. Kent, New York; Joseph C. Regan, New Britain, Conn.

11:30 a. m.—Conference 4: First Moves with Respect to Analysis and Standardization of Process. Presiding, Edwin Krause, Springfield, Mass.; discussion led by Sanford E. Thompson, Boston; W. H. Leffingwell, New York; Charles L. Barnum, Springfield, Mass.; F. R. Wallace, Philadelphia, and A. E. Holmes, Pittsfield, Mass.

Would Deal with Own Employees

In a meeting at Chicago on Feb. 18, the Association of Railway Executives unanimously adopted a report of its labor committee, of which Gen. W. W. Atterbury is chairman, and adopted a set of resolutions, declaring against collective bargaining on nation-wide lines as incompatible with efficient and economical operation of the railroads. This action followed proposals of the railroad union leaders to the United States Railroad Labor Board that the controversy over national working agreements and wages of unskilled labor be referred to a national joint conference of the roads and the unions for settlement. The railroads are not opposed to collective bargaining per se, but insist that individual lines deal with their own groups of employees without reference to conditions which may obtain on railroads in other parts of the country.

Broken Hill Proprietary Plant Closed

WASHINGTON, Feb. 22.—A cablegram to the Bureau of Foreign and Domestic Commerce from Trade Commissioner A. W. Ferrin at Melbourne, Australia, reports that the New Castle Steel Works of the Broken Hill Proprietary Co., Ltd., has been closed on account of the strikes at the mines of the company. The New Castle Steel Works employs about 5000 men. During the year ending May 31, 1920, the company produced 296,000 tons of pig iron from two furnaces with a combined capacity of 1000 tons daily. An additional furnace of 500 tons daily capacity has since been added and preparations are under way for the installation of a fourth blast furnace.

The Westinghouse Electric & Mfg. Co., East Pittsburgh, has announced a wage adjustment, effective March 1, which cuts the present pay of workmen approximately 15 per cent. The announcement, made by H. P. Davis, vice-president in charge of operations, states that the cut is due to competitive market conditions, the decline in prices and the decrease in volume of business.

FATIGUE IN ROLLING MILLS

Study of 8-hr. and 12-hr. Shifts in British Steel Mills

The report of the British Industrial Fatigue Research Board brings out a number of interesting features regarding the operation of blooming mills and other rolling mills in Great Britain, but the chief burden of its story appears to lie in the fact that, as conditions before and after the introduction of the 8-hr. shift are not the same, no direct comparison can be made between outputs before and after, as an index of the fatigue of workmen. Output depends so largely upon the elimination of delays due to lack of material or other causes that, unless these delays be allowed for in the study of output over a definite period, the results are quite likely to be misleading. In some cases managers reported that they believed they would obtain the same or practically the same output, if operating on two 8-hr. shifts per day with two 4-hr. idle periods in between, as they were getting with two 12-hr. shifts. This would imply an average of 50 per cent increased output per hour of working time, but it must be remembered that it would involve also the accumulation of ingots in the soaking pits during the period the mills were idle, and consequently would reduce very markedly the delays in the next shift, incident to lack of material ready to be rolled.

In one case there was a direct comparison in a plant where no changes were made in the equipment during the three years on which the comparison was based. With 12-hr. shifts during the first year, the output was given as 99.5 per cent of an assumed standard. With 8-hr. shifts in the year immediately following, the total output had fallen to 99 per cent, but in the third year, still with 8-hr. shifts, it had risen to 101.5 per cent. Inasmuch, however, as the number of hours actually worked on the 8-hr. shift system was 2.1 per cent greater than on the 12-hr. system, because there was less time out for meals, the apparent improvement of the third year over the first is largely an illusion. In any case, the change was so small as to be negligible.

Effect of Steam Pressure on Output

One element which had a great deal of influence upon the continuous running of the mills was the steam pressure. The firemen, in most cases, were working on 12-hr. shifts, and as they were paid in proportion to the output of the mill, they had every incentive to keep the steam pressure up to normal. It was found however that, undoubtedly due to fatigue, the steam pressure began to fall on the day shift, after 2 p.m., and on the night shift after 10 p.m. Nothing is shown as to the adequacy of the fire room force, nor as to whether an additional man per shift might have relieved the others to such an extent that pressure could have been kept up to normal throughout the shift. And lost time because of deficient steam pressure is only a part of the story, because there are many times when a low steam pressure will still permit the mills to run, but at a much lower speed than that at which they should operate. This does not show in the delay record as lost time, but has its effect none the less on production.

Reduction in Delays Increases Output

Perhaps the most striking case reported of increased hourly output, following the change from 12-hr. to 8-hr. working shifts, was one in which the total hours of work per week were actually reduced by cutting off 4 hr. on Saturday afternoon and 6 hr. between Sunday midnight and Monday 6 a.m. The average for the 15 months' period following this change as compared with the nine months' period preceding showed a gain of 15 per cent by day and 19 per cent by night. And, moreover, the delays in the running of the mills were so much reduced that the average number of hours of actual operation per week was practically maintained as before.

The advent of a new manager in this plant, however, is believed to have been a larger element in the improvement in the hourly output than the change from the 12-hr. to 8-hr. shift. This manager investigated the causes of delay in running the mill and by means of charts and other studies was able to track down some of these causes and reduce them materially. The weekly delays were reduced by several hours, not by any alteration or improvement in the physical part of the plant but solely by greater attention to details in its running.

Other cases were cited where output was much improved following the addition of a soaking pit or group of soaking pits, where a well recognized deficiency in this regard had previously accounted for much delay from lack of hot ingots. Such questions as these have really no direct relation to the effect of fatigue upon output but are normally concerned in the making of a well-balanced mill as against one in which one part or the other has greater capacity than its fellow.

Seasonal Variations

It was shown that the output during the summer was generally less than that during the winter, this being attributed mainly to the greater fatigue of operating in the intense heat of the furnaces and mills during the period of hot weather. Delays were more frequent in summer, and the men could not apply themselves to their tasks with the same amount of energy. In some cases there was a slight indication of a similar difference between day and night, particularly during the summer months, when the coolness of the night as contrasted with the heat of the day made it possible for the men to put forth greater effort and accomplish better results.

General Fireproofing Co. Meeting

"1921 Will Be a Fighting Year" was adopted as a slogan by district sales representatives and agents of the General Fireproofing Co., Youngstown, Ohio, handling the building products manufactured by the company, at the sixth annual convention in Youngstown, Feb. 17, 18, 19. About 200 delegates attended from various parts of the country and voiced the opinion generally that there will be a resumption of new construction with stabilized costs. S. S. French, vice-president and general manager, and W. B. Turner, general sales manager, had charge of the gathering. About 200 representatives attended from all parts of the country.

Trade topics occupied the bulk of the discussions. Among the speakers were G. R. Farrell, traffic manager; C. W. Noble, advertising manager; H. I. Glazier, assistant sales manager; H. B. Wright, manager of the engineering service department; N. B. MacNeely, manager of the Chicago office, and other branch managers.

At the annual banquet on Friday evening, Feb. 18, the New York delegation presented a burlesque on the officials of the company. At this time the company distributed $54,965 in bonuses.

The Griscom-Russell Co., 90 West Street, New York, has recently published a 29-page illustrated booklet entitled "The Cooling of Quenching Oil in the Heat Treatment of Steel," by Kenneth B. Millett. This describes the necessity for heat treatment, the various quenching mediums and systems commonly used, the advantages of continuous circulation of the medium and the adaptability of the Multiwhirl Cooler to the cooling of quenching oil. Typical installations are featured, showing the layout of the piping with recommendations for the proper size and number of coolers to meet the requirements.

The Superior Spring Co., Springfield, Ohio, has recently been incorporated for the purpose of manufacturing all kinds of coil springs from wire up to ½ in. diameter. Automatic equipment is being installed and by March 1 production will be started in charge of Joseph H. Sullivan, who has had 25 years' experience in the manufacture of coil springs. Especial attention will be given to the manufacture of porch swing springs. The factory is located in a modern factory building. The directors are John L. Lloyd, Robert A. Essex, James S. Webb, Hugh Hagan and B. F. Downey, Joseph H. Sullivan, factory superintendent.

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Three Great Monopolies

There are three great monopolies in the United States, the United Mine Workers, supported by the check-off, the railroad unions, supported by conditions created by the United States Government, and the various building trades unions, supported by the fact that the building owner is a different man each time and does not care to make a contest for the benefit of the next man.

The worst of the three is the last named because it presents a condition that will not work out its own remedy but causes continued hardship to the entire population. The cost of coal being too high, the users of coal, constituting in essence practically the whole population, can inquire into the cause and eventually work out a remedy. The facts in the railroad situation are so big that they will attract attention, particularly when the chief business of railroad officials to-day is to bring the situation into the limelight. As pointed out in THE IRON AGE last week, the railroad payroll, which is altogether too high, is 38 times the special one-half per cent in expected revenue against railroad valuation, the percentage the Interstate Commerce Commission accorded the railroads with a view to encouraging the making of betterments.

In the case of the monopoly of the unions in the building trades, there is no general corrective force. It is really everybody's business and perhaps it is on that account that it develops into nobody's business. For years apprenticing has been restricted and the amount of work done per man has been reduced. High initiation fees are charged for admission into the unions. If everything is not absolutely "right" on a building job, and sometimes when it is, a general strike is called. The owner does not want to contest for the good of humanity, his interest being to get the job done. He hopes he will have no occasion to put up another building.

The propaganda about there being "a shortage of houses" makes the matter worse, as equine sense, not to call it practical psychology, would indicate. Does the propaganda influence the carpenters to work harder or the plumbers to avoid "jurisdictional disputes?" Sometimes a civic body takes up "the housing situation," and invariably in the case of there being a deadlock between seller and buyer because the seller's price is too high, it tries to induce the buyer to come to terms. In Pennsylvania they have a law holding down the interest rate to 6 per cent, and they are trying to get the law changed so as to permit the buyer to pay a higher toll for money to be distributed to bricklayers for laying 700 common brick or 300 face brick a day at $1.50 an hour.

In various communities tens of thousands of men will be idle during the next few months, but beware of employing any of them in building construction! There must be unanimous consent of all the unions in the building trades, or work stops. A few building jobs in each community will give positions to the handfuls of men that have their union cards.

The so-called shortage of dwelling houses represents chiefly a desire on the part of people to live better. From 1910 to 1920 the population of the United States increased 14.9 per cent. Many houses vacant in 1910 are now occupied. Few houses have been torn down. Many have been built, by the individual and by large employers of labor. The actual accommodations, in proportion to population, cannot have greatly decreased in the ten years, but men want to live better. They could afford to live better if construction costs were not so inordinately high on account of this peculiar monopoly. If the problem is not solved in the right way, the situation will be met in the wrong way, by people being forced to live in cramped quarters, simply because when it comes to building one is not free to employ whom he chooses and work for whom he chooses. If there are not enough artisans, they can quickly be produced in trade schools.

Obstacles to Steel Reductions

The iron and steel industry being commonly regarded as self-contained, remarks are being made in some quarters to the effect that the industry should at once readjust its prices to the levels that seem to be requisite in order that business may proceed on a broad scale. It is suggested that if the industry were to mark down its prices to the limit business in general would be stimulated. Some producers, it is observed, are "integrated," performing all the operations from mining ore and mining coal and making coke clear through to the finished products of pipe, rails, tin plate, etc., while the non-integrated producers, forming a similar chain under different ownerships, could act in concert and thus reach the same end.

The fact is however that the iron and steel in-

dustry while in one sense self-contained is in reality subject to the dictation of factors over which it has no control. Among these factors are the union bituminous coal mining wage scale, rail freight rates and the cost of living of its employees. These are the three most important factors, but there are many others.

The steel industry uses large quantities of coal mined under the union regulations, with a scale that was signed to run to April 1, 1922, and a very high scale by any comparison that can be made. The large quantity of Connellsville coal that is used in beehive and by-product coke making is, it is true, non-union in production, but the wage rates are in relation to the union rates on a scale that was adopted immediately upon the union bituminous settlement last August, and indeed more promptly than some of the union coal operators adopted scales in conformity with the general settlement. Wages may be reduced in the Connellsville region, but the subject is somewhat awkward.

A large part of the cost of producing a ton of finished steel is made up of wages paid by the iron and steel industry and its affiliated operations. These wages, in general, advanced more than the maximum advance in the cost of living, and the cost of living has since come down; but its decline is expected to be greater eventually, and wages cannot properly be reduced to the limit in anticipation, and all the more so because full time employment cannot be given.

Another large part of the cost of producing the finished steel is freight rates, which are not subject to the dictation of the iron and steel industry. There is fully four net tons of freight movement, in coke, ore, limestone, general supplies and slag wasting, per gross ton of pig iron produced. The steel mill pays freight on coal and various other supplies, and frequently on pig iron and scrap. The finishing mill has some freights to pay. A fair estimate seems to be that taking everything into account the freights borne by the iron and steel industry have approximately doubled since 1914, the year whose low prices are now so frequently mentioned.

Apart from these factors of the union coal agreement, the cost of living of their employees and the freight rates, together with various minor factors, the producers of finished rolled steel have another point that they have every right, from any viewpoint, to consider, and that is the attitude as to prices of no small proportion of their direct customers. As a rule the steel mill does not sell its steel direct to the ultimate consumer or user. In the case of rails and fabricated structural steel it does, but in the case of by far the major tonnage it does not. Some steel is distributed through jobbers and retailers to the ultimate consumer, and the distribution of this steel may perhaps be economical at the present time. A very large part of the steel sold by the mills is to manufacturing consumers, and many of these customers have shown no great disposition to reduce the prices of their finished wares to the smallest margin above the cost of the rolled steel material they use, that would be in keeping with the ruthless price paring that is urged in some quarters upon the producers of steel. What is requisite is to build up actual consumption of steel by the ultimate user. The final buyer must be touched, and that requires co-operation all along the line. There are many things made from steel that are not at present priced to the eventual buyer in keeping even with the Industrial Board prices of rolled steel products. In many cases the steel mill can properly maintain that the next move should be made by its customers, in reducing their selling prices.

Molybdenum and Alloy Steels

Developments in the last three years have brought prominently to the attention of metallurgists and engineers a comparatively new alloy steel. While molybdenum is not as rare an element as was vanadium when it was first introduced, and while it had been incorporated in tool steels some years ago, its use in comparatively small percentages with or without other alloys in structural steels is of recent origin. The entire situation regarding the past and present use of molybdenum in tool and structural steels was clearly and concisely put before the steel sessions of the mining and metallurgical engineers last week by Dr. John A. Mathews. The author believes that "molybdenum has established for itself a permanent place among alloy steels found useful to the airplane, the automobile and general engineering trades."

The paper calls attention to several outstanding qualities of these steels, among which are their wide heat treatment range and the property of unusually deep hardening. There is also freedom from thick and tenacious scale when being rolled.

The physical properties of some of these steels are quite unusual. Besides the points brought out by the author, there have recently been produced some steels which show an elastic ratio of nearly 95 per cent and a malleability or toughness after case hardening which is eminently striking. It is of interest, also, that chrome-molybdenum heat-treated steel castings have been made quite recently which possess striking physical properties. An important consideration is that molybdenum is found in quantity within our own borders, whereas some other important alloying metals are almost entirely of foreign origin, a vital consideration in case of war.

Regarding molybdenum and other alloy steels, Dr. Mathews says:

> It will not wholly displace any other type of steel, but the effect of improvements of this kind and new products has been rather to extend the field of usefulness than to eliminate products of previously demonstrated merit. The Bessemer and open-hearth processes and the electric furnace have not displaced the original crucible cast steel business.

The foregoing developments are a natural consequence of the rapid growth of the alloy steel industry in general. In the five years, 1915 to 1919, there were about 7,300,000 gross tons of alloy steel ingots and castings made in the United States, as compared with some 3,200,000 tons in the five years before the war. Previous to 1909 the production was insignificant by comparison. This development has not reached its height; in its future progress there is room for all present grades of alloy steel, and for the still newer grades in prospect.

Industrial Plant Betterments

Plant betterment work is not the conspicuous development many expected. Industrial establishments generally are supposed to have been run with

no particular attention to economies except such as would increase production without long waiting. Cutting the corners and effecting the little savings which mean so much in the aggregate were left until after the stress for output had subsided. Conservation is still the talk and what is now being done is in the way of studies of process and even of equipment to secure more efficient performance and fuller utilization of by-products and the wastes of yesterday. Conservation of labor remains as always an outstanding problem, but in Europe more concentrated attention is paid to labor-saving machinery. Here the usual salutary effect of the competition for jobs in a period of industrial depression is for the moment counted on for bettering the manual side of industry.

The signs are that the sharpness of the decline of the present readjustment has made an all-absorbing problem of the matter of getting business enough to operate, let alone operating with increased efficiency. It is not likely that departments especially obligated to strive for economies will fail to have a hearing when the business sky brightens. Industrial engineering firms may have reasons to feel somewhat discouraged in their attempts in the recent past to get consideration for beneficiating programs, but our oneness with the rest of the world will of itself force constant inspection of all features of a business—administration, selling and manufacture. The advice of the qualified experts will be asked in due time.

Human relations in industry have doubtedly had the lime light to the exclusion of other important factors, and so many without the experience have presumed to supply remedies to the labor problem that many employers now alienated will be slow to take up the ideas of modern management. What progress has been made in applying scientific methods in putting work through a factory, in paying for output in some measured relation to individual capacity, in maintaining equipment to facilitate maximum performance—such progress may now have a set back, but some recent facts are very reassuring. The scientific method has lately been reinstated after being discarded in the stress of numerous war period changes of personnel and it has been successfully introduced in the truly open shop employing without regard both union and non-union labor.

The relatively small amount of information available on advances in industrial operations is a temporary condition. Plans are made and in the making and there is every reason to believe that 1921 will record broad forward movements in the material if not so much in the human side of industry.

CORRESPONDENCE

The Proposed Duty on Ferromanganese

To the Editor: After reading the request for a specific tariff duty of 2c. per pound on ferromanganese as propounded by E. J. Lavino before the Ways and Means Committee at Washington, the writer craves for space that he may indicate that this testimony as given was not entirely accurate or according to the facts.

The making of ferromanganese in this country is not an infant industry, but has been going on without intermission possibly 20 years, during which time one of the principal producers of steel had been making ferromanganese for its own consumption and has at times sold ferromanganese to other consumers in this country. Mr. Lavino's memory is extremely short when he stated the ferromanganese industry was created as the result of war conditions. If he had added that his entry into the manufacture of ferromanganese in this country was due to these conditions, it would have been more accurate.

His statement in regard to the ocean freight rates seems incomprehensible to anyone who has a knowledge of freight conditions during the past year. He states that while the ocean freight rates coming to this country were $2.50 to $3 a ton, the outgoing freight was equal to $14 a ton, and this was a part of the retaliating measure of the British. No one is better aware of the fact that whatever freight rates existed from this country outward was a matter of the Shipping Board, and that no pooling or body of individuals could possibly have sufficient power to regulate the rates on millions of tons a year, and as it has been shown that the entire quantity which the British manufacturers shipped during the year 1920 was only 59,000 tons, such a statement as this shows most conclusively one of the many inaccuracies in the statement as given by Mr. Lavino.

We would also respectfully call the attention to his further inaccuracies in reference to the prices of ferromanganese in 1913. Taking the average price from the Metal Statistics, we find it to be as follows: 1908, $44.31; 1909, $42.73; 1910, $40.49; 1911, $37.25; 1912, $50.40; 1913, $57.80; 1914, $55.80, and as during the above period, as Mr. Lavino testified, there was practically no ferromanganese manufactured by furnaces to supply the needs of the steel works in this country, it would indicate that if a British pool existed in regard to governing prices, it did not take much advantage of the situation by boosting prices to any undue degree, and that the ones who benefited by these low prices were the actual users and consumers of ferromanganese here.

We would also respectfully state that if the writer remembers correctly, during the period of the framing of one of the tariff bills, E. J. Lavino, Sr., personally appeared in Washington before the Ways and Means Committee and advocated most strenuously free ore and free ferromanganese, due to the fact that ferromanganese could not be manufactured and sold profitably in this country, and it was due to the steel makers to obtain their raw materials at as low a price as possible in order to compete with foreign makers.

It is, of course, of much interest to the users of ferromanganese in this country, which is every steel works, no matter how small, as ferromanganese is to steel like salt to food, to see the effect and what prices have ruled since the war started, and when the foreign competition of ferromanganese was shut off and the domestic manufacturers were able to make such prices as they chose, the prices were as follows: 1915, average, $92.21; 1916, $164.12; 1917, $309.17; 1918, $245.83; 1919, $132.16; 1920, estimated, $135.

During the two latter years, the principal sellers of ferromanganese to the users of steel in this country were E. J. Lavino and the American Manganese Co., both of which companies are advocating a high specific duty on ferromanganese. Mr. Lavino in his testimony asks for a specific duty of 2c. per pound or $44.80 per gross ton as sufficient protection so that he might be enabled to manufacture ferromanganese against the terrible competition derived from British pools and other unknown profiteers who might possibly make inroads into his profits, and while we have not seen notice in your paper, we understood that Radcliffe Romeyn testified that the duty that should be placed on ferromanganese should be 6c. a pound or $134 per gross ton, with the further remark that "it would not make any difference to the steel makers of this country." We might add that Mr. Romeyn did not, as far as the writer heard, produce any testimony from steel makers to this effect.

While Mr. Lavino's testimony was correct that the steel makers in this country were practically dependent on the American product of ferromanganese during the war, and that he and his associates, the American Manganese Co., were the manufacturing concerns that

reaped the principal profits from the necessities of the steel works here, he did not state that this was entirely due to the fact of the impossibility of securing ferromanganese elsewhere and that he nobly came to the rescue and made enormous profits by the sale of ferromanganese, as indicated in the prices as disclosed during the years of 1916-17-18 and 1919. He also did not indicate, and neither did the American Manganese Co., that his costs are probably higher than they otherwise would be, due to the fact of the very great cost of manufacturing due to the purchases of antiquated plants, and the enormous amount of money that he necessarily was compelled to expend in order to manufacture for his own profit.

If a duty was placed on ferromanganese as specified by Mr. Lavino and the American Manganese Co., the only benefit that would accrue would be to the above named concerns, for which the users of ferromanganese would pay in the neighborhood of $5,000,000 a year, as according to the statistics these two concerns would manufacture in the neighborhood of 200,000 tons. There would be no revenue gained by the United States and such a tariff would be purely a protective tariff for the above interests. It would not be fostering an infant industry, as the making of ferromanganese has been going on in this country for 20 years.

I am addressing this letter to your paper with the idea of disproving Mr. Lavino's statement that British pool interests, if there are any, on ferromanganese are operating to the disadvantage of any users of the alloy in this country. In fact, if it was not for British competition Mr. Lavino and the American Manganese Co. by pooling themselves, could charge any price for the product that they desired and it would look, from the evidence given of having a prohibitive duty placed on ferromanganese, that this possibly is their desire.

There has recently been action brought by the Federal Trade Commission to indicate that there has been an unlawful operation of British interests here in selling ferromanganese, but from the evidence so far taken it has been proved most conclusively that there is no pool operation here and that each agent of the different makers of ferromanganese sells individually and without knowledge of the prices which the other agents are quoting, and while it is generally supposed that this investigation has been another means used by the individual makers of ferromanganese in this country to stop importations, it has so far failed, for the very reason that nothing has been shown to indicate other than that ferromanganese is sold in direct competition and at whatever market price is secured from this competition.

If the users of ferromanganese desire all competition to cease, let them endorse a protective duty such as propounded by Mr. Lavino and his associates.

PHILADELPHIA, Feb. 17. FRANK SAMUEL.

Duty on Ferromanganese

To the Editor: Your paper is opposed to unjust trade practices. We are inclosing a copy of a letter which we addressed to the Senate Finance Committee, on the subject of ferromanganese. We believe that the searchlight of publicity should be thrown against unjust tariff demands, and we are confident that all consumers will raise prompt and serious objection to the outrageous rate proposed by a small coterie of American producers of ferromanganese. Your own records will show the tremendous advance in prices, when war conditions made it impossible for American consumers to obtain the British alloy.

Finance Committee,
U. S. Senate,
Washington, D. C. Feb. 15.

Gentlemen:

If newspaper reports are true, the American manufacturers have petitioned your committee to place a duty of $44.80 per ton on ferromanganese, and in view of the fact that there is practically no difference between the United States and foreign cost of producing ferromanganese, we must respectfully protest against this most unreasonable rate. As the Government records will show you, the average selling price of ferromanganese in this country during the period 1908 to 1914 inclusive was only about $47 per ton, and therefore a protection of $44.80 per ton would be a severe penalty to inflict on the American consumers of the alloy.

The Steel Corporation produces its own ferromanganese, and the independent manufacturers of steel would thus be placed at a serious disadvantage, and this tremendous duty would also tend to prohibit the exportation of steel by the independent producers, whose cost of production would thus be materially increased by this duty. Under the tariff act of 1897 ferromanganese was assessed $4 per ton, and under the act of 1909, it was assessed $2.50 per ton, and the present ocean freight and insurance on the European shipments gives the American producers of ferromanganese an additional protection of about $4 per ton.

It may be advisable to place a duty not exceeding the rate given in the tariff act of 1897, but even in that event the American manufacturers should be compelled to show by sworn statements if their cost of production is greater than the foreign cost, after making due allowance for the ocean freight and other charges on the foreign product.

C. W. LEAVITT & Co.

30 CHURCH STREET, NEW YORK, Feb. 17.

Electrical Engineers Discuss Economies

Examples of large combustion losses in modern steel making featured addresses and discussion at the monthly meeting of the Chicago section of the Association of Iron and Steel Electrical Engineers, held at Hotel Morrison, Chicago, on Feb. 19. The meeting followed a campaign for new members which practically doubled the enrollment of the section, 60 new names having been added to the list. The occasion was special in the sense that E. S. Jeffries, electrical engineer Steel Company of Canada, national president of the association; J. F. Kelly, national secretary, and A. H. Schwartz, Iron & Steel Equipment Co., Pittsburgh, chairman of the national program committee, were present.

Papers were read by John Sullivan, assistant superintendent Bessemer plant, Wisconsin Steel Works, on the Bessemer process of steel making, and by F. Von Schlegell, president Industrial Electric Furnace Co., Chicago, on the field of the electric furnace, particularly in the castings industry. Among those who participated in the discussion were H. J. Freyn, Freyn, Brassert & Co., Mr. Jeffries and Gordon Fox, electrical engineer of Freyn, Brassert & Co., and chairman of the Chicago section of the association. Mr. Jeffries, in speaking on the subject of economies, cited what had been accomplished with the McCune type of open hearth furnace. Ordinarily it takes 8,000,000 B.t.u. to make a ton of steel in an open hearth, whereas in the McCune furnace only 4,000,000 B.t.u. are required. The average life of an open hearth furnace is 300 heats, whereas a McCune type furnace will yield 700 heats, he said, before it has to be relined.

It was announced at the meeting that the next annual convention of the national association will be held at Chicago in September on dates as yet unfixed.

The Hess-Briggs Corporation, New York, it is believed, will be awarded the 47,758,838 brass cartridge cases offered for sale by the ordnance salvage board of the War Department. Bids were reopened on Tuesday of last week which revealed the fact that the Hess-Briggs figures, based on a sliding price, dependent upon the copper market, were the highest.

The Iron Age and Its Readers

An editorial in last week's issue showed that if wages of railroad workers were reduced 10 per cent, a total of $360,000,000 would become available for the year. This amount is almost four times the ½ per cent which the railroads were to be allowed for betterment purposes. With wage reductions taking place in so many industries of a much higher percentage than 10 per cent and the decline in the cost of living already in excess of this figure, a decided service would be performed by the wide dissemination of the facts with their influence in bringing about a situation calculated to improve the general business status.

REDUCED HOURS OF WORK

Investigation of National Industrial Conference Board on Week of 48 Hr. or Less

An extensive investigation of practical experience of manufacturers who since the beginning of 1919 have reduced their weekly working schedule to 48 hr. or less has shown that in a great majority of cases the reduction of hours was accompanied by a decrease in weekly output per worker, according to a report issued by the National Industrial Conference Board.

This investigation covered the collective experience of 436 manufacturing establishments employing together 373,536 workers, including establishments in the cotton, wool, silk, boot and shoe, metal and a group of miscellaneous manufacturing industries, and ranging in size from very small plants employing only a few workers to extremely large ones with many thousands of employees.

In 87.2 per cent of the establishments studied a reduction to a work week of 48 h. or less was accompanied by a decrease in weekly output per worker. In 8.7 per cent of the plants the workers were able to maintain weekly production per worker, and in a very few cases (4.1 per cent) weekly output per worker was increased.

In somewhat more than two-fifths of the establishments which noted a falling off in weekly production, the decrease was approximately in proportion to the reduction in hours. In about one-fifth of the establishments showing reduced weekly production the loss in weekly output was less than proportional to the reduction in hours, and in approximately a sixth of the establishments which decreased weekly production the decrease was greater than proportional to the reduction in hours.

In those industries where handwork predominated, or where the skill and speed of the worker in handling machines were the controlling factors—such as in the boot and shoe industry, or in certain kinds of metal manufacturing—it was possible to increase the hourly output of the workers, in some cases to the extent of entirely compensating for the loss in work time and even exceeding the previously weekly production.

In almost every case where a change in output was noted the pieceworkers were more successful in maintaining output than were day workers, and a bonus system in some cases proved an incentive to increased production. It was not found in this investigation that the size of the establishment in itself had any apparent relation to the ability of a plant to maintain output.

In the metal manufacturing industries, out of 117 plants investigated, nine reported that their weekly output had been increased and 16 that they had been able to maintain weekly production.

Safety Meeting in Philadelphia

Dust explosions, crane overhoist limit stops, signals and signalling in industry and the relation of boiler accessories are to be discussed at the midwinter meeting of the engineering section of the National Safety Council which is to be held in Philadelphia, Feb. 28. The meeting is to be held jointly with the Philadelphia section of the American Society of Mechanical Engineers and the Philadelphia local safety council of the National Safety Council. Members of the Philadelphia section of the Association of Iron and Steel Electrical Engineers have been invited.

The program includes the following papers:

Crane overhoist limit stops, by D. M. Petty, electrical engineer, Bethlehem Steel Co., Bethlehem, Pa.

Relation of boiler accessories to safety, by Warren Hilleary, superintendent of schedule rating, Royal Indemnity Co., New York.

Lubrication of air compressors, by Dr. A. D. Risteen, director of technical research, Travelers' Insurance Co., Hartford.

The program for the evening meeting includes two formal addresses to be followed by general discussion, as follows: "A Broader Field for the Engineer," Prof. Dexter S. Kimball, dean of the colleges of engineering, Cornell University; "Safety, the Fundamental of All Engineering," by Chairman L. A. DeBlois, engineering section, E. I. duPont de Nemours & Co., Wilmington.

Industrial Engineering Courses at New York

New York University, through its college of engineering, is conducting educational work for the Babcock & Wilcox Co. at Bayonne, N. J. Starting with a few men in engineering mathematics this work has increased now so that there are two fairly large classes in this subject which are handled by instructors from the faculty of the college. The instruction is given at the plant of the Babcock & Wilcox plant in the evenings.

Work of this character is somewhat novel in that it permits those who are experts in the line of education to do that which they should be able to do better, perhaps, than anyone else. The method of handling the work is inexpensive, because the industry supplies the room, heat and light and the university the teaching experts, the men themselves paying a nominal fee for each course. The burden therefore is distributed and the opportunity of securing the real high grade instruction is thus afforded to men who have not been able at the time of their high school graduation to secure the advantages of higher education. This statement, however, might be qualified to the extent that in these classes there are several men who have had some of these advantages and one or two who are college graduates, but desire to review this work, possibly because, as one intimated, he did not realize the importance of it when he was a student at college.

New York University is also offering a course in industrial engineering with some novel features connected with it whereby the work after the end of the sophomore year becomes co-operative between the university and the affiliated industries. The student spends half his time at the university and half at the industry for the remaining 24 months in periods of 4 mo. each. This is the longest period that has been attempted in co-operative work and while there may be arguments in favor of the short period, such as is in vogue at the University of Cincinnati, yet other universities have tried longer periods and found them successful. This is particularly true with the University of Pittsburgh, which for ten years has carried on a general co-operative plan. They require 2400 hr. of co-operative work before graduation and this is divided into periods of 3 mo. each.

Engineers Recommended for Public Service

At the Syracuse meeting, Feb. 14, the American Engineering Council formally approved of the action of the committee on procedure in requesting the incoming administration to name an engineer as a member of the Interstate Commerce Commission. The committee was authorized to nominate six qualified engineers upon request of the President.

The council also decided to recommend that an engineer be appointed as assistant secretary of war.

It is felt that offices of this character, requiring the highest grade of technical skill, should be filled by men who can use their own knowledge and their own experience in handling the problems brought to them, without having to refer such to others. This would be a long step toward taking these technical problems out of politics and applying to them the trained intelligence which they deserve.

At the annual stockholders meeting of the Pennsylvania Iron Works and its subsidiary, the Pennsylvania Tank Car Co., both of Sharon, Pa., on Feb. 16, directors were re-elected. John Considine is president of the Petroleum company and L. F. Jordan president of the Tank Car interest. The plate shop of the Petroleum Iron Works is operating at 50 per cent, the tank car plant 40 per cent, while the barrel factory is suspended.

Very Low Prices Quoted On Sheets

Some Manufacturers Shade Steel Corporation Schedule $10 Per Ton—Reduced Operations in Mahoning Valley

YOUNGSTOWN, OHIO, Feb. 22.—Low operating rates of independent iron and steel interests, which are approaching bedrock, indicate the complete stagnation which marks steel buying. Reduction of prices by the independents below the Steel Corporation base has thus far produced very little new business. Sheet mill schedules reached a new low record this week. Anticipating a sharp reduction in wages of union sheet and tin mill operatives for the March-April bi-monthly period, certain sheet manufacturers are reported to be shading the Steel Corporation base on the three grades about $10 a ton, on deliveries after March 1. This action brings sheet prices to the new low minimums of 3.05c. base for blue annealed, 3.85c. base for black and 5.20c. base for galvanized. Some open-hearth sheet bar tonnage has changed hands at $43, though certain non-integrated makers look for a price as low as $40. Buying interests everywhere are holding off, the mills report. Recovery, expected to come in the spring, will likely be slow. As a result of the stagnant market, first quarter reports of district companies are likely to be very unfavorable. Reduced pipe business is indicated by the slackening production of the two leading interests.

Limitation of Price Decline

Makers point out there is a limitation upon price declines, in view of high transportation costs and that expectations of a return to pre-war price levels are unwarranted for that reason. At current prices the margin on business booked is very small, while some interests say that existing prices mean loss on certain production. Mills are anxious for business, however, to provide employment for their workers and to work off inventories which have been marked down, with the expectation of replacing them with supplies purchased at lower prices. Freight costs in steel production are represented principally in assembly of raw materials, such as ore, coal, coke and limestone, large tonnages of which are required.

A belief persists in the Valley, therefore, that buyers must shortly realize the futility of continuing to hold out for still lower quotations and that part of the overhanging demand will be translated into orders. The largest producing interests are feeling effects of the buying decline as well as the smaller companies and business which ordinarily emanates from regular channels is being held in abeyanace.

Few Active Furnaces

Some independent steel makers continue to pile iron and for that reason the number of active blast furnaces in the Mahoning Valley remains at 12, half of which are operated by the Carnegie Steel Co. Of the 51 independent open-hearth steel furnaces, only 13 are melting, while 13 open-hearth units of the Carnegie company are charged, giving a total of 26 active units out of 66. Sheet mill production is under 10 per cent of capacity.

Tube mill operations, which have been well sustained in the Valley up to this time, are rapidly declining and are affecting other departments such as plate mills, which have rolled skelp, Bessemer departments and so on. Youngstown Sheet & Tube Co., for instance, is operating only four of 11 tube mills, while Republic Iron & Steel Co., which has hitherto maintained its tubular department in full operation, has cut the number of active units from six to four. Reflecting decline in demand for iron pipe is the suspension of the finishing mills of the Girard plant of the A. M. Byers Co., Pittsburgh, for the first time since the present buying slump started. The Girard works of the company has operated close to normal, but only the blast furnace and puddling mills are active this week.

Sharon Plants Started

The only exception to the declining rate of operations is reported by the Sharon Steel Hoop Co., which is starting idle units after prolonged shutdown. At its Lowellville plant the company is operating a blooming and continuous mill and the 8-in., 9-in., 10-in. and 14-in. mills at the Sharon works. Finishing mill schedules of Carnegie Steel Co. plants are sliding.

The best indication of the stoppage of orders is found in the operating schedules of the Sheet & Tube company and the Republic company. The latter interest is operating two blast furnaces, three bar mills at the Brown-Bonnell works and its tube mills at 80 per cent. Otherwise, its production is nil. The Sheet & Tube interest is likewise operating but two blast furnaces, four of 12 open-hearths, rod mill, blooming mill one turn and four tube mills. Brier Hill Steel Co. is operating but one blast furnace and six open-hearths, piling the steel output for the present in anticipation of sheet and plate business. Trumbull Steel Co.'s operations are confined to four of seven open-hearths, probably 10 sheet and tinplate mills and some strip mill capacity. An indication of renewed activity in strip steel is the resumption by the Trumbull company of one unit which has been idle for over three months.

Aside from the above record, the capacity of the Mahoning Valley will be idle this week. The plant of the Newton Steel Co. has been down for nearly three months.

Further indications of the decline in business of the Steel Corporation and its subsidiaries is the lower operating rate of its Shenango Valley plants. For instance, the sheet mill department of the American Sheet & Tin Plate Co. at the Farrell works, which up to Jan. 23 operated 17 turns a week, has been reduced to nine turns for an indefinite period. Similarly the tin mills are working only three days a week.

The National Malleable Castings works at Sharon has adopted as its operating program for the present a full week's schedule of three 8-hr. turns.

Railroad Loan Proposed

WASHINGTON, Feb. 22.—Permission has been asked of the Interstate Commerce Commission by the Louisville & Nashville Railroad to negotiate a loan of $4,500,000 from J. P. Morgan & Co. to make a cash payment upon the purchase of equipment with an estimated value of $14,933,379.72, as follows:

Twelve passenger, 16 freight and six switch locomotives, $2,045,480.72; 43 passenger cars of various types, $1,178,909; 200 box, 2000 hopper bottom coal, 300 coke, 300 gondola, 100 stock and 100 caboose cars, $11,405,980.

Labor Leaders Sentenced

Alexander M. Howat, president Kansas district, United Mine Workers of America, and five members of the district executive board, were sentenced a year in jail and payment of all court costs by District Judge Curran of Crawford County, Kan., on Feb. 16. Howat and his colleagues were found guilty of contempt of court for calling a strike at two mines in violation of an injunction granted by Judge Curran last September. Howat has an appeal pending before the Supreme Court of the State, attacking the validity of the Kansas Industrial Court.

The United States Railroad Labor Board, sitting at Chicago on Feb. 14, rendered a decision forbidding the Erie Railroad from cutting its employees' wages or changing their working conditions pending a hearing to be held on Feb. 23. The Erie reduced the wages of track men to 30 cents an hour on Feb. 1, ordered train dispatchers to work seven days a week and made other changes on its own initiative. A protest was filed with the labor board by the United Brotherhood of Maintenance of Way and Railroad Shop Employees and the American Train Dispatchers' Association.

Iron and Steel Markets

REDUCED OPERATIONS

Stagnation in Buying and Erratic Prices

Demand for Readjustment of Railroad Wages—Further Declines in Pig Iron and Steel

With new buying so small that it is difficult to estimate and a receding scale of operations on the part of the United States Steel Corporation, thoughts are now centered on transportation charges as one element in manufacturing costs which has not had a revision. Demand is developing for a readjustment of railroad wages and thus of railroad freight rates. A 10 per cent reduction in railroad wages would supply almost four times the amount of money the roads were to be allowed for betterment purposes. The settlement of the German indemnity is recognized as an item in the revival of business, but its influence is not so easily measured.

New low prices have been named, but some of these do not necessarily represent the possibility of an immediate repetition, and there is a disposition not to tear the market wide open in view of the small amount of business available. A few manufacturers with unabsorbed stocks of material are trying to make sales by deep price cuts, presumably to minimize inventory losses. Such conditions obtain, mainly in the sheet trade, though they have been noted in reinforcing bars and in standardized fabricated steel.

The Steel Corporation in the Chicago district has dropped to a 65 per cent ingot operation and three blast furnaces have been blown out, 20 now being active out of 29. In Pittsburgh active ingot making is not more than 70 per cent of the whole, as compared with about 80 per cent a week ago. The leading independents appear to average about 25 per cent and are active, as is true of the Steel Corporation, chiefly in pipe making. Some mills are making steel in one week and rolling it the next. The Carnegie Steel Co. now has 43 furnaces in blast, two less than last week. The American Steel & Wire Co. is operating well below a 50 per cent basis, and the American Sheet & Tin Plate Co. has failed to maintain the recent 70 per cent activity, showing a loss in sheets rather than in tin plate, possibly through the holding back of shipping instructions in the face of independent prices $5 and $7 lower.

Steel bars are easily obtained at 2.10c., Pittsburgh basis, but sales have been made at 2c., and 1.95c. has been quoted. Plate quotations range from 2.15c. to 2.20c., though here also 2c. has been named, with doubt now that business could be done at this basis except on an unusually attractive lot.

Plain structural material is soft in line with other major forms of rolled products, but in the East an increase in fabricated steel inquiries is noted, and some sizable contracts have been let, including several for Japan. Fabricators appear to discount lower material prices, in some cases reaching 4½c. per lb. Resale fabricated steel has been offered in the Middle West at as low as $65 per ton.

Wildest prices mark the sheet market, ranging from 3.70c. for resale black sheets to 4.10c. from mill, the latter representing a $2 drop from the level obtaining in the last two weeks. Resale galvanized sheets have been offered at 4.85c., while mill quotations range from 5.20c. as in Chicago to 5.35c in Pittsburgh, the latter representing a $3 per ton drop in the week and $7 in two weeks. Wire nails are off $3 following a $5 drop in plain wire a week ago.

Strip steel, both hot and cold rolled, is one of the stronger items in finished products, most mills being still above the Steel Corporation levels.

The recent decline of $5 per ton in the price of basic pig iron in the Valley has not brought out much business, but an additional sale of 1000 tons has been made. Although not tested, the basic market in eastern Pennsylvania is regarded as at least $3 lower than when the last sale was made. The general tendency of the pig iron market is still downward. Prices on foundry iron have declined $1 at Cleveland and Pittsburgh and are uncertain in other centers, with the general feeling that considerably lower prices would be named if inquiry for desirable tonnages appeared. Some rumors of very low prices have not been confirmed, but their influence has had a depressing effect on the market.

Our cable reports the purchase by Brazil of 7000 tons of rails in Luxemburg and an inquiry from Australia for 8000 tons of plates, though the order is expected to be placed in the United States.

High-speed steel is now squarely at $1 per lb., and large lots have moved at 90c.

The Santa Fe Railroad is conspicuous in the railroad buying of the week, having purchased $100,000 worth of machine tools for New Mexico shops, on which there was spirited competition and consequently some price cutting, and it is inquiring for 1000 gondola cars, involving about 10,000 tons of steel.

It will not be surprising if shortly a revision is made of all rail freight charges to the Pacific Coast from Pittsburgh and Chicago plants. If a reduction of one-third is made it will bring the all-rail rate somewhat below that of the water route.

Pittsburgh

PITTSBURGH, Feb. 21.

The drive for business at cut prices on the part of some of the independent steel companies seems to be falling short of attaining its purpose, in that those which have been most active in the pursuit of orders are not materially busier than they have been, and the fact that one large independent maker in Pittsburgh again is quoting the Steel Corporation levels on most products, after having indicated a willingness to meet competitive prices, would rather indicate that not a great deal of business actually exists at any price at present. The effect of the low prices named by the independents has not been to fill their order books, but rather to make buyers more conservative, and this tendency has been felt by most of the Steel Corporation subsidiaries, which, because of lighter specifications, are not as busy as they were recently. The effect upon the Steel Corporation order book, however, is not nearly

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Feb. 22, 1921	Feb. 15, 1921	Jan. 25, 1921	Feb. 24, 1920
No. 2X, Philadelphia‡	$30.09	$30.09	$32.09	$45.35
No. 2, Valley furnace†	*27.00*	28.00	30.00	42.00
No. 2 Southern, Cin'ti†	32.00	32.00	34.50	43.60
No. 2, Birmingham, Ala†	27.50	27.50	30.00	40.00
No. 2, foundry, Chicago*	28.00	28.00	31.00	43.00
Basic, del'd, eastern Pa	*28.40*	31.40	32.50	43.40
Basic, Valley furnace	25.00	25.00	30.00	43.00
Bessemer, Pittsburgh	28.96	28.96	33.96	43.40
Malleable, Chicago*	28.50	28.50	31.50	43.50
Malleable, Valley	*27.00*	28.00	32.00	43.00
Gray forge, Pittsburgh	*27.96*	28.96	30.96	42.40
L. S. charcoal, Chicago	38.50	38.50	40.50	57.50
Ferromanganese, Atl. port	90.00	90.00	100.00	180.00
Rails, Billets, Etc., Per Gross Ton:				
Bess. rails, heavy, at mill	$45.00	$45.00	$45.00	$45.00
O.-h. rails, heavy, at mill	47.00	47.00	47.00	47.00
Bess. billets, Pittsburgh	*38.50*	43.50	43.50	58.00
O.-h. billets, Pittsburgh	38.50	38.50	43.50	58.00
O.-h. sheet bars, P'gh	42.00	42.00	47.00	60.00
Forging billets, base, P'gh.	43.50	43.50	48.50	75.00
O.-h. billets, Phila	49.24	49.24	49.24	64.10
Wire rods, Pittsburgh	52.00	52.00	57.00	65.00
Finished Iron and Steel, Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	2.70	2.70	2.70	4.25
Iron bars, Chicago	2.63	2.63	2.68	3.50
Steel bars, Pittsburgh	*2.00*	2.10	2.35	3.00
Steel bars, New York	*2.38*	2.48	2.73	3.27
Tank plates, Pittsburgh	*2.15*	2.25	2.65	3.50
Tank plates, New York	*2.53*	2.63	3.03	3.77
Beams, etc., Pittsburgh	*2.15*	2.20	2.45	2.70
Beams, etc., New York	*2.53*	2.58	2.83	2.97
Skelp, grooved steel, P'gh.	2.45	2.45	2.45	2.45
Skelp, sheared steel, P'gh.	2.65	2.65	2.65	2.65
Steel hoops, Pittsburgh	2.80	2.80	3.05	3.50

*The average switching charge for delivery to foundries in the Chicago district is 70c. per ton.
†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

Sheets, Nails and Wire, Per Lb. to Large Buyers:	Feb. 22, 1921 Cents	Feb. 15, 1921 Cents	Jan. 25, 1921 Cents	Feb. 24, 1920 Cents
Sheets, black, No. 28, P'gh.	*4.10*	4.20	4.35	5.00
Sheets, galv., No. 28, P'gh.	*5.35*	5.50	5.70	6.50
Sheets, blue an'l'd, 9 & 10.	3.20	3.20	3.55	4.25
Wire nails, Pittsburgh	*3.10*	3.25	3.25	4.50
Plain wire, P'gh	3.00	3.00	3.25	3.50
Barbed wire, galv., P'gh.	3.85	3.85	4.10	4.45
Tin plate, 100-lb. box, P'gh.	$7.00	$7.00	$7.00	$7.00
Old Material, Per Gross Ton:				
Carwheels, Chicago	*$19.00*	$20.50	$21.00	$34.50
Carwheels, Philadelphia	23.00	23.00	25.00	42.50
Heavy steel scrap, P'gh	16.00	16.00	16.00	27.00
Heavy steel scrap, Phila.	14.50	14.50	14.50	25.00
Heavy steel scrap, Ch'go	*14.50*	15.00	15.50	24.00
No. 1 cast, Pittsburgh	*22.00*	23.00	25.00	34.00
No. 1 cast, Philadelphia	23.00	23.00	23.50	40.00
No. 1 cast, Ch'go (net ton)	*17.50*	18.00	18.00	37.00
No. 1 RR. wrot, Phila	*19.00*	20.00	20.00	36.50
No. 1 RR. wrot, Ch'go (net)	*13.00*	13.50	14.00	26.00
Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt	$4.50	$4.50	$5.00	$6.00
Furnace coke, future	5.75	5.75	6.00	6.00
Foundry coke, prompt	5.50	5.50	6.00	7.00
Foundry coke, future	6.50	6.50	7.00	7.00
Metals, Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	*13.25*	13.50	13.25	19.25
Electrolytic copper, N. Y.	*12.75*	13.00	12.75	19.00
Zinc, St. Louis	*4.95*	5.00	5.40	9.00
Zinc, New York	5.35	5.35	5.55	9.35
Lead, St. Louis	*4.20*	4.35	4.80	8.75
Lead, New York	*4.40*	4.70	5.00	9.00
Tin, New York	32.50	32.50	32.50	64.00
Antimony (Asiatic), N. Y.	*5.20*	5.25	5.50	11.62½

The prices in the above table are for domestic delivery and do not necessarily apply to export business.

as great as might be expected, for the reason that in a number of products, notably merchant bars, the corporation is practically alone in being able to make prompt deliveries, and the delivery, rather than the price, is what counts with those who actually require tonnages. Buyers who have been interested in the market by low quotations invariably have asked for early delivery as a condition of purchase. Since the amount of business presented has been in only a few cases sufficient to provide a fair rolling schedule and so much independent capacity is idle at present, the best delivery promised by a number of those naming lower prices than the corporation has been six weeks.

There continues to be considerable interest with regard to the probable future course of the Steel Corporation as to prices and wages. Some see in the diminishing rate of operations by the subsidiaries the possibility of early action on selling prices, but it must be said that no such impression is gained at the offices of the corporation constituents in this district. It may be said that there is full realization on the part of the sales managers of the possibility of lower prices, but it is also appreciated that consumers of steel are more interested in decreasing rather than adding to their stocks at present, and that any demand that exists would be covered as promptly at present prices as at lower quotations. It is pointed out that the concessions offered are not the result of competitive conditions and, not being a creation of the law of supply and demand, necessarily are artificial.

Wild reports continue in circulation as to the prices of the various products. There are reports that 1.95c. has been done on merchant bars, but if such a price has been named it cannot be charged to either Pittsburgh or Valley producers. Reports also are current of quotations as low as 2c. on plates, of 4c. on black sheets and of $3 on nails. About the only products on which sharply lower prices have not been included in the gossip are tin plate and tubular goods. Generally the low prices which are rumored find little substantiation in actual sales.

As far as plant operations are concerned, there has been no material change in the rate of the independent companies, which continues at about 25 per cent of capacity among the plants in the Pittsburgh, Wheeling and Valley districts. The leading Pittsburgh independent has only two of its 12 blast furnaces making pig iron, and its general operating average is brought up chiefly by the fact that it is running 80 per cent of its pipe furnaces. About 25 per cent of the independent open-hearth furnaces in the Mahoning and Shenango Valleys are scheduled for the week, but outside of the pipe furnaces very little finishing capacity will be engaged. In the Wheeling district the Wheeling Steel & Iron Co. is idle and the Whitaker-Glessner Co. is operating its Portsmouth, Ohio, works on a 40 per cent rate. Labelle Iron Works is operating both its Wheeling and Steubenville works, but at average rate of only about 50 per cent. Resumption of full operations by the McKeesport Tin Plate Co. is the only important change among independent Pittsburgh companies. The story about the Steel Corporation subsidiaries is one of falling operations, except in the case of the National Tube Co., which continues to report 100 per cent operations. The Carnegie Steel Co. has withdrawn the blast on one Duquesne furnace and at its furnace in Sharon, now having 43 stacks blowing. The Homestead works of the company is running 100 per cent, but the Duquesne works is down to about 55 per cent capacity and its Columbus, Ohio, plant has shut down. Total active ingot making capacity is not more than 70 per cent of the whole, as compared with about 80 per cent a week ago. The American Steel & Wire Co. has closed down all of its open-hearth furnaces at Donora, Pa.,

and general operations of the company are understood to be well below 50 per cent of capacity. The American Sheet & Tin Plate Co. has failed to maintain the recent operating rate of 70 per cent of capacity, the loss in sheet mill activities being greater than in its tin plate mills, presumably because of the holding up of shipping instructions due to the low sheet prices being named by independent makers. No further change is observed in the steel making grades of pig iron by merchant producers, but the effect of last week's decline is seen in a recession of $1 per ton in the prices of foundry grades.

Practically no market exists in either coke or scrap and prices of these materials are nominal.

Pig Iron.—Last week's reduction in the price of standard basic iron to $25 by a merchant interest with furnaces in the Valley has not resulted in any appreciable increase in the demand, although we note one other sale, by the company which made the cut, of 1000 tons at the same figure. The new price probably would be accepted by other merchant producers, but at the moment it must be said that they are not especially eager for business at $25, because their actual costs are considerably in excess of that figure. There are reports from brokerage circles that basic has been offered at $23, Valley furnace, without takers, and also a vague rumor that a lot of 10,000 tons recently was sold from a Valley furnace at $20. Actual verification of either report is lacking and on real sales $25, Valley furnace, represents minimum on standard basic iron. A Pittsburgh district steel company has disposed of some off basic at $24.50, furnace, some of the tonnage going to a Homestead melter, the price in this case being equal to about $24, Valley furnace basis. We note a small sale of malleable iron for shipment west at $27, Valley furnace, and that price also has been done on No. 2 foundry iron. Sales of the latter grade also have been made at $28, Valley furnace, but $27 appears more representative of the present possibilities of the market than the higher figure. In fact, a price of $26.25, Valley furnace, was quoted a broker having an inquiry for 500 tons of this grade. It is reported, but not confirmed, that the Union Radiator Co., Johnstown, Pa., recently secured 200 tons of No. 2 foundry at $28, delivered. As the freight rate from the Valley to Johnstown is $2.80, a price of $28, delivered, would be equal to $25.20 if the iron came from that district. The supposition is that the iron, if sold, came from a furnace having a lower freight rate into Johnstown.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being $1.96 per gross ton:

Basic	$25.00
Bessemer	27.00
Gray forge	26.00
No. 2 foundry	27.00
No. 3 foundry	26.50
Malleable	27.00

Wire Rods.—Almost nothing is going on, but it is patent that buyers would not have to pay more than $52 base for soft rods as most of the independents are willing to take business at that price. The American Steel & Wire Co. still is holding at $57, although it is common gossip that before long this company will go back to the Industrial Board price of $52. Prices are given on page 543.

Plates.—Business is almost nil despite the willingness on the part of some of the independent companies to go as low as 2.15c., Pittsburgh, to secure orders. Few buyers seem to need plates, although it is estimated that there is 6000 to 7000 tons which would be closed in this district if it became evident that prices had reached the bottom. Most independents are disinclined to go below 2.25c. on tank quality plates at present and one company which was disposed to meet competitive quotations this week went back to the Steel Corporation base.

We quote sheared plates of tank quality ¼ in. and heavier at 2.15c. to 2.65c., Pittsburgh.

Ferroalloys.—Trading still is stagnant and quotations entirely nominal. If there is a definite tendency of prices, it is downward. Makers of 50 per cent ferrosilicon are adhering firmly enough to their recent asking prices of $92 to $95 furnace, freight allowed. We note a sale of a carload to a Pittsburgh machinery builder at $95, delivered, but as the material was packed in barrels, the price is equivalent to somewhat under $90 in bulk. Practically all users of this material are balking at the prices now being asked, and the indications point strongly to the Steel Corporation taking on tonnages as they are needed rather than placing a contract for its entire 1921 requirements. No change is observed in prices of ferromanganese but spiegeleisen no longer is quotable at higher than $35 furnace, for average 20 per cent material, as the leading makers now are quoting this price against such inquiries as are coming out. In view of the fact that prices of Bessemer ferrosilicon and silveries are based upon the price of foundry iron, the recent decline in the latter is likely to soon find reflection in the former. It is doubtful whether buyers could be induced to take hold to-day even as much as $5 per ton below current quotations.

We quote 76 to 80 per cent domestic ferromanganese at $100 furnace, freight allowed; British, $100 c.i.f. Atlantic seaboard; resale tonnages, $90 delivered. We quote average 20 per cent spiegeleisen at $35 furnace, on direct business; 50 per cent ferrosilicon, $92 to $95 furnace, freight allowed, on direct business. Bessemer ferrosilicon is quoted f.o.b. Jackson County and New Straitsville, Ohio, furnaces, as follows: 9 per cent, $54.50; 10 per cent, $58; 11 per cent, $61.30; 12 per cent, $64.60. Silvery iron, 6 per cent, $40; 7 per cent, $41.50; 8 per cent, $43.50; 9 per cent, $45.50; 10 per cent, $48; 11 per cent, $51.30; 12 per cent, $54.50. The present freight rate from Jackson and New Straitsville, Ohio, into the Pittsburgh district is $4.06 per gross ton.

Structural Material.—There continues to be a fairly good number of inquiries for fabricated steel and estimating departments of Pittsburgh district companies are all busy. Actual orders, however, remain sadly out of line with the request for prices. The award of the steel for the new mill of the International Nickel Co., Huntington, W. Va., has been deferred for another month. The extension to the Federal Reserve Bank at Richmond, Va., amounting to 400 tons, has been placed with Belmont Iron Works, Philadelphia. The George A. Fuller Co., New York, has the general contract for the new Boston Latin School, but has not yet placed the 600 tons of steel required for this building. The Thompson-Starrett Co., Pittsburgh, has the general contract for the new Frank & Sedar building, Detroit, but is doing a good deal of shopping before placing the steel. The tendency to defer awards has been marked since the inauguration of the drive by independents for business in plain material, at less than Corporation price. Quotations as low as 2.15c. are heard on both plates and shapes for structural purposes. Prices are given on page 543.

Wire Products.—The market is dull and on nails prices are rather indefinite. Ironton, Ohio, makers are quoting nails at $3.25, base, per keg, Ironton and this, over much of the territory tributary to that district, is equivalent to $3, Pittsburgh. All makers here are quoting $3.25 on nails, but it is understood that one of them made a price of $3.10 in competition with Ironton mills. Practically all independent makers have increased their discounts on woven wire fence 2½ points, and now are underselling the leading interest. Not less than $2.85 per count keg can be done on coated nails, but the market rather favors buyers on wire, both plain and galvanized.

We quote wire nails at $3.10 to $3.25 base per keg, Pittsburgh, and bright basic and Bessemer wire at $3 to $3.25 base per 100 lb., Pittsburgh.

Iron and Steel Pipe.—New demands in both oil country and standard pipe still are dwindling, but capacity is fairly well engaged on old orders. The latter, however, are being filled in much heavier volume than new ones are coming forward and it is only a question of a short time before there will be a recession in the active furnaces. Intimations of price concessions in either steel or iron pipe find no substantiation. The spread between prices of steel and iron pipe is unusually wide at present and because of the smaller demand and the decline in pig iron, it is expected that wrought iron pipe prices will decline first. Discounts are given on page 543.

Iron and Steel Bars—Not much business in merchant steel bars is coming to independent makers in this district and one of them which had been inclined to follow

the lead of the Midvale Steel & Ordnance Co. has gone back to the Corporation base of 2.35c. Quotations ranging from 2.15c. down to 1.90c., Pittsburgh, are reported, but definite details as to sellers and buyers, as well as tonnages involved are not available. Little independent bar mill capacity is engaged and the past week has seen a considerable decline in the active capacity of the Carnegie Steel Co. Iron bars are dull and unchanged.

We quote steel bars rolled from billets at 1.95c. to 2.35c.; reinforced bars, rolled from billets, 2.25c. to 2.35c. base; refined iron bars, 3.25c., in carloads, f.o.b. mill, Pittsburgh.

Sheets.—Increased operations by the Ford Motor Co. have resulted in releases against suspended shipments by that company, the American Sheet & Tin Plate Co. having had shipping instructions for 3000 tons. Generally, however, the demand for sheets remains extremely slow and the low quotations as named by some of the independents have affected the order book of the leading interest to the extent that last week it was unable to maintain its schedule operations of 70 per cent. Independent sheet mill operations remain under 20 per cent of capacity. Prices of independents are indefinite because willingness on their part to let buyers name prices has not been productive of many orders. It is stated that a really desirable tonnage of black sheets would be accepted by some as low as 4c., base. Prices are given on page 543.

Tin Plate.—The situation shows some improvement. The McKeesport Tin Plate Co., which has been running about 24 of its 44 mills, this week went on to full operation as a result of increased specifications, accompanied by rush shipping instructions. The American Sheet & Tin Plate Co., which had figured on stocking the bulk of its production, received specifications in such numbers as to be obliged to stock only one-third of its output. One specification received by this company was for 65,000 boxes. Packers appear to have liquidated their stocks of canned goods to a point where prices are showing some improvement, and about 250,000 cases of condensed milk were worked for export in the past week. Container manufacturers view the outlook more hopefully as a result of these developments and are more anxious for tin plate than they were recently. There is close observance of $7 per base box, Pittsburgh, by all makers.

Hoops and Bands.—Offers of tonnages well below the Steel Corporation price of 3.05c. do not seem to have found much response on the part of buyers. Apparently requirements are not heavy and 2.80c. base is no more tempting to buyers than the higher price.

Spikes.—The Pittsburgh & Lake Erie Railroad is seeking 1400 to 1500 kegs of standard spikes, but the general demand is extremely slow. All makers now are quoting 3.65c., Pittsburgh, on standard spikes. The Republic Iron & Steel Co., which hitherto has been holding to 4c., has revised its quotations in the past week. New demands in small spikes also are light, but most makers have a few weeks live business in sight. Prices are given on page 543.

Cold-Finished Steel Bars.—Demand probably never before in the history of the industry has been so nearly at a standstill as it is at present, and it is doubtful whether as much as 10 per cent of the finishing capacity in this district now is engaged. Nominally all makers are quoting the old base of 3.60c., but there is no question that this figure would be shaded materially on desirable business, a price as low as 3.25c. being mentioned. This figure apparently is based upon hot-rolled bars at 2c. plus the usual differential for cold rolling of $25 per ton. It may be that the ultimate base on cold-finished steel bars will bear a closer relation to the price of hot-rolled bars, as there is no question that $20 per ton for cold-finishing would yield all but the very small manufacturers a satisfactory profit. Most of the current business is in less than carload lots and on these buyers are able to secure the carload base, which is a concession of $5 per ton as the nominal asking price on less carloads is 3.85c.

Hot-Rolled and Cold-Rolled Strips.—The fact that the Ford Motor Co. has released a good deal of suspended business with parts makers for March shipment has caused a slightly more cheerful tone in the market for strips, although there has been only a slight increase in the demand and shipping instructions against old orders are not coming forward with much, if any, more freedom than they have recently. Generally makers are quoting hot-rolled strips at 3.30c. base and cold-rolled at 6.25c. base. These prices, however, are not being observed by all makers and business could be placed $5 per ton or lower. Hot-rolled strips are being offered at the Steel Corporation price of 3.05c. by some independents and even as low as 3c. has been reported. It is believed attractive tonnages of cold-rolled strips could be placed at 6c. base. The Industrial Board quotation was 5.65c. on this material.

Nuts, Bolts and Rivets.—Business in bolts and nuts still drags and while some makers still are able to maintain fairly high operations, one large company recently went on to a four-day a week schedule and barring early improvement in the demand, is likely to curtail further before the end of the month. All makers are well caught up with their obligations and new demands are neither numerous nor large. Lack of demand is not due to prices so much as it is to the business depression. The rivet market is weak and while the public quotations are unchanged, there is no doubt that concessions are being offered. Prices and discounts are given on page 543.

Coke.—Only about 40 per cent of the Connellsville ovens are in operation and production is at the lowest notch in a long time, particularly by the so-called merchant ovens, only about 25 per cent of which now are producing. The furnaces and foundries dependent upon Connellsville coke, however, are no more fully engaged than they have been and what ordinarily would be considered a very small supply is ample for current needs. The market, consequently, is easy. Really good furnace coke now is readily obtainable at $4.50 per net ton oven, and while some operators are not inclined to consider less than $5, only uninformed consumers or those who want to make a selection will go that high for supplies. Furnace coke contracted for on a ratio based upon the price of Valley basic pig iron would take a price of $5.75 per net ton oven, that being the minimum named in such agreements, but practically all of the furnaces that had such contracts are down and shipments are practically nil. The recent decline in Valley basic pig iron to $25 has started a movement for a readjustment of such contracts, furnace interests claiming that they must secure coke at not over $5 if they are to get out whole at the present price of the iron. Contract furnace coke for the remainder of the present half-year is being offered by some operators at $5 per net ton oven, but no business yet has been done. Spot foundry coke is quotable from $5.50 to to $6.50 with the bulk of the business right around $6. No contract business is being done in foundry coke and the price is indefinite.

Billets, Sheet Bars and Slabs.—Trading is absolutely stagnant and prices indefinite. Less steel works and billet, sheet bar and slab mill capacity is engaged now than before in several years, but finishing mill operations also are at a very low ebb and with stocks of semifinished steel at the latter ample, the light production is not a factor in prices. It is doubtful whether attractive inquiries of sheet bars carrying a price of $42 would go begging, and some sheet makers declare that they cannot pay even that price and get out whole on the prices they now can obtain for finished sheets. The decline in pig iron and the very low prices at which scrap now is available also contribute to the lower price ideas of the nonintegrated steel manufacturers.

We quote 4 x 4-in. soft Bessemer and open hearth billets at $38.50; 2 x 2-in. billets, $40.50; Bessemer and open hearth sheet bars, $42; slabs, $41; forging billets, ordinary carbons, $43.50, all f.o.b. Youngstown or Pittsburgh mills.

Old Material.—Continued recession in steel plant and foundry operations, not to mention a further drop in pig iron prices, notably in the steel-making grades,

is reflected in a weaker market in scrap iron and steel. We make no important changes in the quotations from those of a week ago, but the prices now represent approximately what melters would pay for supplies, instead of dealers' buying prices. This change represents a decline of 50c. per ton in all grades, as there is that much difference between dealers' buying and selling prices. Although the steel mills are not buying much material from the dealers, they seem to be taking tonnages on direct purchase from producers. This is evident from the fact that on recent sales of railroad scrap, little or none of the tonnage has gone to the dealers. Since dealers who bid up to $16.25 for heavy melting railroad steel failed to secure allotments, it is evident that melters are paying more. Consequently, it may be said that $16 to $17 represents a fair approximation of the value to steel makers of heavy melting steel and prices of other open-hearth grades are based on the price of heavy melting grade. The demand, such as it is, runs entirely to small lots which can be delivered immediately. On a purchase of this sort, the National Tube Co. recently is reported to have taken some No. 1 cupola cast at $23.50, although it could have bought for at least $1 per ton less if it had been in a position to wait a few weeks for delivery. Dealers are not buying much material to throw down on their yards, because there is little available as low as they figure they can afford to pay, and moreover, the prospect of early sales of such tonnages is not very bright with the steel plants and foundries slowing down.

We quote for delivery to consumers' mills in the Pittsburgh and other districts taking the Pittsburgh freight rate, as follows:

Heavy melting steel, Steubenville, Follansbee, Brackenridge, Monessen Midland and Pittsburgh	$16.00 to $17.00
No. 1 cast cupola size	22.00 to 23.00
Rerolling rails, Newark and Cambridge, O.; Cumberland, Md.; Parkersburg and Huntington, W. Va.; Franklin, Pa., and Pittsburgh	17.00 to 18.00
Compressed sheet steel	13.00 to 14.00
Bundled sheet sides and ends, Pittsburgh district	11.00 to 12.00
Railroad knuckles and couplers	16.50 to 17.50
Railroad coil and leaf springs	16.50 to 17.50
Railroad grate bars	14.00 to 15.00
Low phosphorus melting stock, bloom and billet ends, heavy plates, ¼-in. and heavier	23.00 to 24.00
Railroad malleable	16.00 to 17.00
Iron car axles	36.00 to 37.00
Locomotive axles, steel	32.00 to 33.00
Steel car axles	22.00 to 23.00
Cast iron wheels	22.00 to 23.00
Rolled steel wheels	16.50 to 17.50
Machine shop turnings	10.00 to 11.00
Sheet bar crop ends at origin	15.00 to 16.00
Heavy steel axle turnings	13.00 to 14.00
Short shoveling turnings	12.00 to 13.00
Heavy breakable cast	16.00 to 17.00
Stove plate	15.00 to 16.00
Cast iron borings	12.00 to 13.00
No. 1 railroad wrought	16.00 to 17.00

Coming Convention

The annual convention of National Pipe and Supplies Association, originally scheduled to be held in Pittsburgh on May 10 and 11, has been transferred to Hotel Hollenden, Cleveland, on account of the high charges demanded by the Pittsburgh hotels and the lack of sufficient accommodations.

The Associated Industries of Seattle, representing 2300 employers organized on the American, or open-shop plan, announce a reduction of 12½ per cent in the wages of painters and decorators, effective at once. On this plan painters will receive $7 in place of $8 per day. This follows a reduction in the building trades as of Feb. 1 of 20 per cent, which brings the wage of carpenters to $6.40 per day. Building investors claim this wage is still too high and out of proportion to the cost of materials.

The Empire Machinery Exchange Co., Inc., Cleveland, has changed its address to 517-519 Newman-Stern Building, Cleveland.

The London offices of Baird & Martin, Inc., American steel mill representatives, have been removed to 10 New Broad Street, E. C. 2.

STRUCTURAL STEEL TO JAPAN

Office Buildings in Tokio—Rail Needs of Dutch East Indies 50,000 Tons Annually

NEW YORK, Feb. 21.—The activity in construction of office buildings in the city of Tokio, Japan, has resulted in the placing of several thousand tons of structural material with American mills. The erection work on three of these buildings is being done by a subsidiary of the George A. Fuller Co., New York, organized in the Far East as the George A. Fuller Co. of the Orient. The award for 5000 tons of steel in the Maranouchi Building, being erected for Mitsubishi & Co. in Tokio, went to the erector, George A. Fuller Co. of the Orient and was placed with the United States Steel Products Co. Another of the three buildings being erected by this company is an office building for the Nippon Yusen Kaisha, the steel for which will total several thousand tons and has not yet been awarded. The award of 3100 tons of steel for the new building of the Yokahama Specie Bank in Tokio, mentioned in THE IRON AGE, Feb. 17, went to Takata & Co. and was placed with the American Bridge Co. Perin & Marshall, New York, consulting engineers, recently closed large contracts for work near Calcutta, India.

It is stated on good authority that the railroad needs of the Dutch East Indies will be in the neighborhood of 50,000 to 60,000 tons of rails a year for several years. Activity in railroad construction is at present greatest on the island of Sumatra, where a line is under construction from the north to the south of the island. One of the difficulties met by the Netherlands Government in placing orders for rails in the United States, aside from considerations of price, is the fact that the average mill in this country rolls 33-ft. rails, while most of the specifications from the Dutch East Indies are for 44-ft. to 46-ft. lengths. The shorter lengths were accepted during the war period because nothing else was available, but Germany and Belgium now offer rails according to specifications. The last large rail inquiry, issued late in 1920 in various steel producing countries, was lost to continental mills on price.

A sale of about 1200 tons of steel bars by a mill for export is said to have been made at 1.95c. per lb., Pittsburgh. While there is a fairly large volume of inquiry for China, Japan and England, much of it is evidently largely for the purpose of testing the market.

New Engineering Firm

Charles W. McKay has entered into partnership with P. C. Sherman, New York, under the firm name of McKay & Sherman, for the practice of the engineering evaluation of industrial and public utility properties. The firm will also specialize in the preparation of valuations and financial reports for investment bankers. Mr. McKay is known in both the industrial and public utility fields. He is the author of the book, "Valuing Industrial Properties," published in 1918, and of a book entitled "Telephone Rates and Values," to be published by the Cornhill Co., Boston. During the past two years Mr. McKay has written over 100 articles for technical and trade journals on the general subject of valuation. He is a member of the Advisory Council of the Industrial Extension Institute. The past two years he has supervised the appraisement of over $100,000,000 worth of industrial and public utility properties. Mr. Sherman, vice-president, is president of Sherman & Associates, Inc., New York. Their offices will be at 741 Monadnock Block, Chicago.

Botwinik Brothers, New Haven, Conn., machinery, has purchased the 127 x 150 ft. property of the Celluloid Starch Co., that city, which will be used as a warehouse. There are two buildings on the property, one, a five-story brick and the other a three-story wooden, which give a total of 50,000 sq. ft. of floor space. The consideration was approximately $85,000. The firm will occupy its new quarters March 1. The executive offices will remain at 21 Sylvan Ave. The concern has just opened a large machinery warehouse on Drouve Street, Bridgeport, Conn., with A. A. Johnson, formerly of New Haven, in charge.

Chicago

CHICAGO, Feb. 21.

The most important development of the past week was a curtailment in operations by the leading steel interest. One blast furnace has been blown out at Gary and two at South Works, one of which, however, has been put on ferromanganese, making the number of active stacks of that company 20 out of 29. The company's steel output has been reduced to 65 per cent of ingot capacity. The Inland Steel Co. is on about the same basis as a week ago, with the exception that its 24-in. structural mill has been put into operation and its plate mill will be taken off early in the week. The status of other producers in this territory is substantially unchanged.

Prices have not yet found a stable level and in view of the limited amount of business that is being done it is difficult to name ruling quotations. On mild steel bars and on plates as low as 2c., Pittsburgh, has been quoted in this district, while 2.10c. on the former product and 2.20c. on the latter are named rather commonly by independent mills. Bar iron and rail carbon steel bars have also shown weakness and pig iron, although unsteady, is on approximately the same price level as a week ago.

Pig Iron.—Business has been exceedingly light during the past week and there have been few new developments. Although it is possible that better prices can be obtained than those published below, no orders have appeared to bring out such quotations. It is reported that on a Wisconsin inquiry a Southern furnace quoted $25 base, Birmingham, for No. 2 foundry. A Milwaukee consumer has bought 100 tons of 2 to 3 per cent Bessemer at approximately $29, Chicago. The American Radiator Co. is in the market for 1000 to 2000 tons of foundry for Detroit delivery. Good grades of beehive foundry coke are now available at from $6 to $6.50, Connellsville, as against the by-product price of $13, local oven. Silvery has again declined, both 7 and 8 per cent being available at $40.53, delivered Chicago.

The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable and steel-making irons, including low phosphorus, which are f.o.b. furnace and do not include a switching charge averaging 70c. per ton:

Lake Superior charcoal, averaging sil. 1.50, deliv. at Chicago	$38.50 to $40.50
Northern coke, No. 1 sil. 2.25 to 2.75	29.25 to 30.25
Northern coke foundry, No. 2, sil. 1.75 to 2.25	28.00 to 29.00
Northern high phos	28.00 to 29.00
Southern coke, No. 1 foundry and No. 1 soft, sil. 2.75 to 3.25	37.17
Southern coke, No. 2 foundry, sil. 2.25 to 2.75	35.42
Southern foundry, sil. 1.75 to 2.25	34.17
Malleable, not over 2.25 sil.	28.50 to 29.50
Basic	28.00 to 29.00
Low phos. Eastern furnace (copper free)	40.00
Silvery, sil. 7 per cent	40.53

Ferroalloys.—Fifty per cent ferrosilicon has shown some weakness of late, $92 delivered being quoted by some sellers and a price of as low as $90 having been reported. The market is quiet in all of the ferroalloys.

We quote 75 to 80 per cent ferromanganese, $90 to $95 delivered; 50 per cent ferrosilicon, $92 to $95 delivered; spiegeleisen, 18 to 22 per cent, resale, $42 to $45 delivered.

Plates.—The demand is light and it is difficult to name a ruling price. It is clear, however, that a buyer would experience little trouble in purchasing material at 2.20c., Pittsburgh, and on one recent local inquiry 2c., Pittsburgh, was named by an independent mill. The steel for the Louisville & Nashville cars has not yet been let. The Santa Fe has issued an inquiry for 1000 composite gondola cars which will call for about 10,000 tons of plates, shapes and bars.

The mill quotation is 2.20c. to 2.65c., Pittsburgh, the freight to Chicago being 38c. per 100 lb. Jobbers quote 3.78c. for plates out of stock.

Bars.—All classes of bars are weak. As low as 2c., Pittsburgh, on mild steel bars has been quoted in this district, and from 2.10c. to 2.20c. is rather commonly named by independents. Bar iron and hard steel bars are also unsteady. A local manufacturer purchased 100 tons of hard steel bars at 2.20c., f.o.b. mill, and another local consumer bought 50 tons of bar iron at less than 2.60c., Chicago. Warehouse prices are also unstable, particularly on deformed steel bars, attractive lots of which have been taken at the former mill price of 2.35c., Pittsburgh, plus the freight of 38c. per 100 lb.

Mill prices are: Mild steel bars, 2.10c. to 2.35c., Pittsburgh, taking a freight of 38c. per 100 lb.; common bar iron, 2.60c. to 2.63c., Chicago; rail carbon, 2.20c. to 2.50c. mill, nominal.

Jobbers quote 3.48c. for steel bars out of warehouse. The warehouse quotation on cold rolled steel bars is 5.25c. for rounds and 5.75c. for flats, squares and hexagons, an extra of 15c. per 100 lb. applying to orders exceeding 1000 lb. and under 2000 lb. and an extra 35c. on orders up to 1000 lb. Jobbers quote hard and medium deformed steel bars at 3.48c. base.

Rails and Track Supplies.—A few roads are pushing the local mills for rail delivery, but so far as new business in rails and track fastenings is concerned there is little to be said.

Standard Bessemer rails, $45; open-hearth rails, $47; light rails, 2.75c., f.o.b. makers' mills.

Standard railroad spikes, 3.65c., Pittsburgh. Track bolts with square nuts, 4.60c., Pittsburgh. Steel tie plates, 3c., and steel angle bars, 2.75c., Pittsburgh and Chicago; tie plates, iron, 3c., f.o.b. makers' mills.

Structural Material.—Few new fabricating jobs have made their appearance and little pending work has been let. The Missouri Pacific has let 150 tons for plate girder spans to the American Bridge Co. The demand for plain material is light with independent quotations in the neighborhood of 2.20c., Pittsburgh.

Sheets.—With no improvement in inquiry, sheets are weaker, this being particularly true of galvanized, on which a quotation of 5.20c., Pittsburgh, for No. 28 gage was made last week.

Mill quotations are 4.10c. to 4.35c. for No. 28 black; 3.15c. to 3.55c. for No. 10 blue annealed, and 5.20c. to 5.70c for No. 28 galvanized, these all being Pittsburgh prices, subject to a freight to Chicago of 38c. per 100 lb.

Jobbers quote: Chicago delivery out of stocks, No. 10 blue annealed, 4.68c.; No. 28 black, 5.75c.; No. 28 galvanized, 7.10c.

Wire Products.—An important independent continues to offer concessions on wire nails and wire without bringing out much new business. Trade, however, has shown slight improvement in some directions. The South, which was a closed market for several weeks, is now buying in limited quantities. The seasonal demand for poultry fence is still under way and there is moderate buying of nails, although less than normally. The leading interest continues to pile stocks, but is maintaining operations at close to a normal rate. For mill prices, see finished iron and steel, f.o.b. Pittsburgh, page 543.

Cast-Iron Pipe.—Detroit, which recently rejected bids on a large tonnage on the grounds that further price reductions would develop, has asked for tenders on March 2 on 1000 tons. This action is regarded as an encouraging portent by pipe sellers. Present indications not only point to buying against pending inquiries, but the appearance of considerable new business. Aside from slight shading on attractive jobs, the market is steady at the quotations named below. Miles City, Mont., has awarded 600 tons to the American Cast Iron Pipe Co. Low bidders on recent inquiries follow:

Council Bluffs, Iowa, 500 tons, National Cast Iron Pipe Co.
Grand Rapids, Mich., 500 tons, Lynchburg Foundry Co.
Rockford, Ill., 300 tons, United States Cast Iron Pipe & Foundry Co.

Bolts and Nuts.—Current buying is limited and is confined principally to jobbers. This is no doubt due to the fact that manufacturers are calling on the warehouses for their day-to-day needs, being unwilling to purchase for any period ahead. Aside from shading on large bolts, prices are fairly firm. Going manufacturers' prices on bolts and nuts are those published under finished iron and steel, f.o.b. Pittsburgh, page 543, except that on large machine and large carriage bolts the freight from Pittsburgh to Chicago is conceded.

Jobbers quote structural rivets, 5.08c.; boiler rivets, 5.18c.; machine bolts up to ⅞ x 4 in., 50 per cent off; larger sizes, 45 off; carriage bolts up to ⅞ x 6 in., 40 off; larger sizes, 40 off; hot pressed nuts, square and hexagon tapped, $1.60 off; blank nuts, $1.85 off; coach or lag screws, gimlet points, square heads, 50 and 5 per cent off. Quantity extras are unchanged.

Old Material.—Except for a moderate purchase of malleable, buying by consumers has been at a low ebb. Neither buyers nor sellers evince confidence in the stability of the market and prices are generally weak. Railroad lists include the Burlington, 4000 tons; the Pennsylvania Southwest, 1100 tons; the Louisville & Nashville, 5000 tons of relaying rails; and the New York Central, a blind offering.

We quote delivery in consumers' yards Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton	
Iron rails	$20.50 to $21.00
Relaying rails	32.50 to 37.50
Car wheels	19.00 to 19.50
Steel rails, rerolling	15.00 to 15.50
Steel rails, less than 3 ft.	16.00 to 16.50
Heavy melting steel	14.50 to 15.00
Frogs, switches and guards, cut apart	14.50 to 15.00
Shoveling steel	14.00 to 14.50
Low phos. heavy melting steel	17.00 to 17.50
Drop forge flashings	10.50 to 11.00
Hydraulic compressed sheet	11.50 to 12.00
Per Net Ton	
Iron angles and splice bars	19.50 to 20.00
Steel angle bars	13.50 to 14.00
Iron arch bars and transoms	19.50 to 20.00
Iron car axles	34.50 to 35.00
Steel car axles	17.00 to 17.50
No. 1 busheling	13.00 to 13.50
No. 2 busheling	9.00 to 9.50
Cut forge	13.00 to 13.50
Pipes and flues	10.00 to 10.50
No. 1 railroad wrought	13.00 to 13.50
No. 2 railroad wrought	13.00 to 13.50
Steel knuckles and couplers	13.50 to 14.00
Coil springs	16.00 to 16.50
No. 1 cast	17.50 to 18.00
Low phos. punchings	14.50 to 15.00
Locomotive tires, smooth	12.00 to 13.00
Machine shop turnings	7.00 to 7.50
Cast borings	10.00 to 10.50
Stove plate	17.00 to 17.50
Grate bars	12.50 to 13.00
Brake shoes	12.00 to 12.50
Railroad malleable	15.00 to 15.50
Agricultural malleable	15.00 to 15.50
Country mixed	9.50 to 10.00

Birmingham

BIRMINGHAM, ALA., Feb. 21.

Pig Iron.—The Birmingham iron market appeared to steady itself after the establishment of the $27.50 level and none lower had been heard from up to the close of the week. One furnace interest booked about 1500 tons of iron during the week at $27.50 to $30, much of the $30 business being acceptance on quotations previously made. The interest first announcing $27.50 booked over 3000 tons, of which 1000 tons was sold in strictly competitive territory, St. Louis district. Immediate delivery was ordered on practically all contracts recently booked. Iron for radiator interests commenced moving from yards the day the order was entered. The same is true of sanitary manufacturing interests ordering iron. Prompt delivery is easily affected by the absence of deliveries of old contract iron, which it seems as hard as ever to induce consumers to take. One furnace interest has disposed of a lot of this by accepting $7 to $10 per ton cash on $40 and $42 metal and closing it out in that way. The leading interest continues to ignore the general market. In spite of the slightly better tone, indications seem to point to a strong effort to hammer the market down to $25. With equal obstinacy the Alabama merchant interests are restricting themselves to a four-stack production. No large tonnages that would serve to establish a new level have been offered. One encouraging element is the amount of cast iron pipe that continues to go to the Pacific coast. The Gulf States Steel Co. has closed down its open hearth department until March 1, by which time it is thought the finishing mills will have caught up with the supply on hand. Independent steel producers agree that February business has been better than that of January, but that does not mean any large tonnage. The leading interest is operating both iron and steel departments at about 90 per cent, having resumed in the structural mill.

We quote per gross ton f.o.b. Birmingham district furnace, the Tennessee company included, as follows:

Foundry, sil. 1.75 to 2.25	$27.50
Basic	26.50
Charcoal	40.00

Cast Iron Pipe.—The Birmingham district pipe makers joined last week in the shipment of 3000 tons via boat out of Mobile to the Pacific coast, the participants being the United States Cast Iron Pipe & Foundry Co., the American Cast Iron Pipe Co., the National Cast Iron Pipe Co., the Stockham Pipe & Fittings Co., the Birmingham Pipe & Fittings Co. and the Hammond-Byrd Iron Co. The United States company and the American company will each ship another exclusive cargo of 3000 tons the same way March 1. Breckenridge, Tex., has taken 3800 tons of water pipe, 6 to 16 in., on which the United States company is to supply 1900 tons. The schedule of $55 has not been changed.

Coal and Coke.—The coal and coke markets are alike weak and prices are sagging. The Sloss-Sheffield Steel & Iron Co.'s by-product plant is operating at 50 per cent, and Newcastle beehive ovens are down. Standard foundry can be gotten under $8.

Old Material.—There is nothing to say about the scrap market. The largest consumers of steel scrap are not buying at all and dealers are not anxious to sell anything at the low offers made. Prices quoted are nominal.

We quote per gross ton, f.o.b. Birmingham district yards, prices to consumers, as follows:

Old steel rails	$13.00 to $13.50
No. 1 heavy steel	12.50 to 13.00
No. 1 cast	18.00 to 19.00
Car wheels	18.00 to 19.00
Tramcar wheels	16.00 to 17.00
No. 1 wrought	15.00 to 16.00
Stove plate	12.00 to 12.50
Cast iron borings	5.00 to 6.00
Machine shop turnings	5.00 to 6.00

Buffalo

BUFFALO, Feb. 24.

Pig Iron.—The volume of business on the books and in prospect in this district is so inconsequential that one sales manager said he has not seen such stagnation in the iron trade in 30 years. Hope of business because of unusually heavy inquiry two weeks ago has not been realized by sellers who reported queries for prices on approximately 35,000 tons. The usual inquiry is for carload lots. One producer who fixed a price of $30 base on lots of foundry iron greater than 1000 tons and $32 base on tonnages less than that figure, reports his present price is $30 regardless of the size of the order. Reports are current of furnace iron sold at less than $30 but verification is lacking. Some resale has been sold at $28, but for delivery outside this territory. A sales agency reports sales of 4500 tons at $30, and new inquiries for 6000 tons. Inquiry at the same office brightened the first two days of the week but not sufficiently to raise hopes.

We quote f.o.b. dealers' asking prices per gross ton Buffalo as follows:

No. 1 foundry, 2.75 to 3.25 sil.	$31.00 to $33.00
No. 2X foundry, 2.25 to 2.75 sil.	29.25 to 31.25
No. 2 plain, 1.75 to 2.25 sil.	28.00 to 30.00
Basic (nominal)	30.00
Malleable (nominal)	32.00
Lake Superior charcoal	40.64

Finished Iron and Steel.—Price cutting has not brought any rush of orders to mills in this territory. One interest has a few orders for small bar tonnages but these will be disposed of within 10 days and a shutdown is expected. A company reported to have competed with Midvale prices, reported present adherence to the Steel Corporation schedules but that it will meet competitive figures within reason. The same company states a price less than 2.10c. on bars is below cost. Parke, Davis & Co., Detroit, are expected to refigure on its new building on account of prices not being low enough.

Warehouse Business.—Greater activity is noted in this line but individual orders are for small quantities. A local jobber sees improvement in prospect and says inquiry is better and from a wider circle of buyers. A buying embargo exists among many users and although they have business on the books these buyers are restrained from buying because of policies adopted by their managements. A local jobber sees better warehouse business because of the uncertainty of mill prices.

Jobbers quote prices f.o.b. Buffalo as follows: Structural shapes, 3.60c.; plates, 3.80c.; plates, No. 8 gage, 4.65c.; soft steel bars and shapes, 3.50c.; hoops, 4.60c.; blue annealed sheets, No. 10 gage, 4.70c.; galvanized steel sheets, No. 28 gage, 7.10c.; black sheets, No. 28 gage, 5.75c.

Old Material.—One buyer has bought heavy melting steel at the quoted price of $15 but is paying close attention to each shipment and insists on first grade material. There is belief among dealers that prices may advance and with that in mind there is no great desire to sell at prices now asked.

We quote dealers' asking prices per gross ton, f.o.b. Buffalo, as follows:

Heavy melting steel	$15.00 to $16.50
Hydraulic compressed	13.00 to 14.00
Low phos., 0.04 and under	22.00 to 23.00
No. 1 railroad wrought	20.00 to 21.00
No. 1 machinery cast	20.00 to 21.00
Iron and steel axles	30.00
Car wheels	20.00 to 21.00
Railroad malleable	16.00 to 17.00
Machine shop turnings	11.00 to 12.00
Heavy axle turnings	14.50 to 15.50
Clean cast borings	11.00 to 12.00
Iron rails	23.00 to 24.00
Locomotive grate bars	15.00 to 16.00
Stove plate	17.00 to 18.00
Wrought pipe	14.00 to 15.00
No. 1 busheling	13.00 to 14.00
Bundled sheet stampings	10.00 to 11.00

St. Louis

ST. LOUIS, Feb. 21.

Pig Iron.—The continuance of the condition which has existed for some weeks is about all that can be reported for the pig iron market. Foundries are doing a little work and are taking an occasional carload, but this is about all that is going on.

Coke.—As in pig iron there is no business of consequence stirring in coke, because there is no immediate need for it, and such concerns as are using it are already covered by existing agreements. There has been no open change in the price situation.

Finished Iron and Steel.—In finished products there is no change from last reports, although both mill representatives and warehousemen are hopeful that within a short time the opening of spring will lead to a little activity at least.

For stock out of warehouse we quote as follows: Soft iron bars, 3.57½c.; soft steel bars, 3.57½c.; structural material, 3.67½c.; tank plates, 3.87½c.; No. 10 blue annealed sheets, 4.77½c.; No. 28 black sheets, cold rolled, one pass, 5.85c.; No. 28 galvanized sheets, black sheet gage, 7.20c.

Old Material.—Nothing is developing in the scrap market except a little trading among the dealers in small lots. Most of the mills are closed and in consequence are buying nothing at all. Considerable of the railroad scrap offered is being taken at merely nominal prices. No new railroad lists have come out except one of 1200 tons from the Pennsylvania, closing on Feb. 24. Next week, however, will bring further offerings, it is expected.

We quote dealers' prices f.o.b. consumers' works, St. Louis industrial district, as follows:

Per Gross Ton	
Old iron rails	$18.00 to $18.50
Old steel rails, rerolling	15.00 to 15.50
Old steel rails, less than 3 ft.	14.50 to 15.00
Relaying rails, standard section, subject to inspection	35.00 to 40.00
Old car wheels	19.50 to 20.00
No. 1 railroad heavy melting steel	13.50 to 14.00
Heavy shoveling steel	12.00 to 12.50
Ordinary shoveling steel	11.00 to 11.50
Frogs, switches and guards cut apart	13.50 to 14.00
Ordinary bundled sheet	6.00 to 6.50
Per Net Ton	
Heavy axle and tire turnings	7.00 to 7.50
Iron angle bars	17.00 to 17.50
Steel angle bars	12.00 to 12.50
Iron car axles	29.00 to 29.50
Steel car axles	16.50 to 17.00
Wrought arch bars and transoms	17.00 to 17.50
No. 1 railroad wrought	12.00 to 12.50
No. 2 railroad wrought	12.00 to 12.50
Railroad springs	12.00 to 12.50
Steel couplers and knuckles	12.00 to 12.50
Locomotive tires, 42 inches and over, smooth inside	10.00 to 10.50
No. 1 dealers' forge	9.00 to 9.50
Cast iron borings	7.50 to 8.00
No. 1 busheling	12.00 to 12.50
No. 1 boilers, cut to sheets and rings	8.00 to 8.50
No. 1 railroad cast	17.00 to 17.50
Stove plate and light cast	15.00 to 15.50
Railroad malleable	12.00 to 12.50
Agricultural malleable	12.00 to 12.50
Pipes and flues	10.00 to 10.50
Railroad sheet and tank	8.00 to 8.50
Railroad grate bars	12.00 to 12.50
Machine shop turnings	5.00 to 5.50
Country mixed	9.00 to 9.50
Uncut railroad mixed	10.00 to 10.50
Horseshoes	15.00 to 15.50
Railroad brake shoes	11.00 to 11.50

Boston

BOSTON, Feb. 21.

Pig Iron.—Interest the past week centered largely in the Sullivan Machinery Corporation, Claremont, N. H., purchase of 100 tons Virginia, silicon 3.25 to 3.75, 100 tons Northern, silicon 2.25 to 2.75, and 100 tons, silicon 1.75 to 2 with phosphorus under 0.20, nearby shipment. While the amount involved is insignificant, prices at which iron was offered are decidedly so, inasmuch as they give a true insight to the desire of furnaces for business. No authentic statement regarding the purchase is made, yet it is known there was a spread of $7 a ton in Virginia prices offered, and the company bought Virginia iron at around $26.50 furnace base and eastern Pennsylvania at less than $28. Many bids made by letter on a $28 furnace base carried an appendix that if the price was too high the purchasing agent was asked to make an offer. For silicon 1.75 to 2, the company bought Buffalo Bessemer at considerably less than $30 furnace base. The Amoskeag Mfg. Co., Boston, textiles, bought 300 tons No. 2 X and No. 1 X iron at private terms, and the Putnam Machine Works, Fitchburg, Mass., 100 tons, silicon 1.75 to 2.25, from an associated foundry at private terms. These, and carlot sales at around $30 furnace base, bring the aggregate for the week up to approximately 1200 tons. Furnaces continue to have trouble in getting foundries to accept high-priced contract iron. Melters needing iron often purchase a car of spot at going prices and then ask deferred shipment on contracts. Price cutting on castings brings some business, but foundries in general are operating on about a Feb. 1 basis. Delivered pig iron prices follow:

East. Penn., silicon 2.25 to 2.75	$33.31 to $35.31
East. Penn., silicon 1.75 to 2.25	32.06 to 34.06
Buffalo, silicon 2.25 to 2.75	34.71 to 36.71
Buffalo, silicon 1.75 to 2.25	33.46 to 35.46
Virginia, silicon 2.25 to 2.75	35.83 to 40.83
Virginia, silicon 1.75 to 2.25	34.58 to 39.58
Alabama, silicon 2.25 to 2.75	39.41 to 41.91
Alabama, silicon 1.75 to 2.25	38.16 to 40.66

Finished Material.—The market for bars, shapes, plates, sheets, etc., continues practically at a standstill, according to mill representatives, due to the unsettled condition of prices. Structural shapes have been offered in this district at 2c. f.o.b. Pittsburgh. Warehouse business in iron and steel is confined to odds and ends. Competition among jobbers for bolt, nut and horseshoe orders is keen, and price cutting is in order. Foundries have reduced prices on window weights $5 a ton. Sheet zinc is ½c. per lb. lower at 13c. base.

Jobbers now quote: Soft steel bars, $3.63 per 100 lb. base; flats, $4.50 to $4.85; concrete bars, $3.63 to $3.75; tire steel, $5 to $5.50; spring steel, open hearth, $6.50; crucible, $12; steel bands, $4.33 to $5.25; steel hoops, $5; toe calk steel, $7; cold rolled steel, $5.25 to $6; structural, $3.63 to $4.25; plates, $3.93 to $4.32; No. 10 blue annealed sheets, $5.20; No. 28 black sheets, $6.05; No. 28 galvanized sheets, $7.40; refined iron, $3.75 to $5.50; best refined, $5.50; Wayne, $8.50; band iron, $4.58; hoop iron, $5; Norway, $12.

Ferroalloys.—An inquiry for 25 tons ferromanganese has been withdrawn from the market, but is expected to be revived in about a month. Several hundred pounds of ferrosilicon has been purchased by a Masscahusetts consumer on a basis of 6c. per lb. f.o.b. shipping point.

Coke.—The demand for foundry coke continues light, with New England made prompt shipment offered at $12.70 to $13.60, where the local freight does not exceed $3.40." Connellsville foundry has been offered and accepted at $6 ovens or $12.20 delivered, while New Jersey has been purchased in slightly larger quantities at $6.50 Connellsville oven or $11.26 delivered New England points, and sometimes slightly less. Many of the large coke consumers, based on their present foundry meltings, have enough stock on hand to last several months and therefore have not signed 1921 contracts.

Old Material.—A Massachusetts foundry bought several hundred tons No. 1 machinery cast at approximately $25 delivered, prompt shipment, but the market otherwise was dull and featureless since last reports. Stove makers are more active, yet not interested in scrap. Pennsylvania mills are still willing to purchase old material at a price, contending the market is out of line with the pig iron, but New England dealers are

not anxious to sell. The latter, however, continue to pick up small lots of scrap. Local yard prices on old material follow:

No. 1 heavy melting steel	$8.50 to $9.00
No. 1 railroad wrought	15.00 to 16.00
No. 1 yard wrought	12.00 to 13.00
Wrought pipe (1-in. in diameter, over 2 ft. long)	10.00 to 10.50
Machine shop turnings	7.00 to 7.50
Cast iron borings, rolling mills	7.00 to 8.00
Cast iron borings, chemical	9.00 to 10.00
Heavy axle turnings	8.00 to 8.50
Blast furnace borings and turnings	4.50 to 5.00
Forged scrap and bundled skeleton	7.00 to 7.50
Street car axles, steel	19.00 to 20.00
Car wheels	20.00 to 21.00
Machinery cast	20.00 to 21.00
No. 2 cast	18.00 to 19.00
Stove plate	15.00 to 15.50
Railroad malleable	15.00 to 15.50
Rerolling rails	12.00 to 13.00

Cleveland

CLEVELAND, Feb. 22.

Iron Ore.—The Interstate Commerce Commission has set March 12 as the date for the hearing of the application filed late last year by the ore mining companies for reduction in rail rates on ore from all Lake Superior district mines to the upper lake ports, this hearing to take place at the Federal Building, Chicago. However, the railroads have asked for a continuance, claiming that it is impossible to get their data together in time, and following the usual practice, it is expected that a continuance will be granted. Ore shippers naturally want to get the benefit as early as possible during the coming shipping season of any rate reductions that may be made, but they see little chance of getting a decision before the middle of summer at the earliest. Some of the independent mining companies that reduced wages Feb. 1 expect to give the wage situation further consideration shortly, and it is not unlikely that another wage cut will be made about April 1. There has been some further curtailment of mining operations in the Lake Superior district.

We quote delivered lower lake ports: Old range Bessemer, $7.45; old range non-Bessemer, $6.70; Mesabi Bessemer, $7.20; Mesabi non-Bessemer, $6.55.

Pig Iron.—The market shows little life. Lake furnace prices on foundry iron have declined $1 a ton to $28, at which several small lot sales have been made. The American Radiator Co. has a new inquiry out for 1000 tons of foundry iron for its Detroit and Titusville, Pa., plants for prompt shipment, and a Toledo foundry is inquiring for 1000 tons of foundry iron for the second quarter, but it is understood the latter inquiry was sent out to obtain prices for use in quoting on castings. The establishment of the basic pig iron market at $25 in the Pittsburgh district is expected to have the effect of bringing the price of foundry iron down somewhat near the basic price, and it is believed that a good inquiry would bring out a quotation of from $27 to $27.50 from the Valley district, which recently has set the pace for price reductions. There is considerable resale foundry iron in the market that is being offered from $1 to $2 a ton below the prices asked by furnaces.

We quote delivered Cleveland as follows, based on the new freight rates, these being a 56c. switching charge for local iron, a $1.96 freight rate from Valley points, a $3.36 rate from Jackson and $6.67 from Birmingham:

Basic	$26.96 to $28.96
Northern No. 2 fdy., sil. 1.75 to 2.25	28.56
Southern fdy., sil. 2.25 to 2.75	35.42 to 37.92
Ohio silvery, sil. 8 per cent	46.86
Standard low phos., Valley furnace	43.50 to 44.00

Coke.—There is some activity in by-product foundry coke. We note the sale of 10 carloads at $7.85 at oven, but a later price of $7.50 has come from another producer. Connellsville foundry coke is quoted at $5.75 to $7 for standard makes, but few sales are reported.

Finished Iron and Steel.—The recent price reductions by some of the independent mills have done little toward stimulating business in any line. One noticeable feature of the market which is evidently due to the price cut is the offer of considerable resale steel by local consumers. This is probably material for which they have no immediate need, and consequently they are attempting to dispose of it before prices go lower. Soft steel reinforcing bars are being offered for resale at 1.75c., and a lot of fabricated steel for a standard size building is being offered at $65 per ton. The price situation shows little change. Plates are freely offered by independent mills at 2.25c. to 2.40c., with reports of a 2.20c. price, and steel bars are quoted at 2.10c. to 2.25c. In structural lines bids will be taken this week for the Wade Park Manor apartments, requiring 2500 tons. Bids have been asked for 450 tons of soft steel reinforcing bars for the Cleveland City Hospital. Local jobbers have reduced prices on nails and wires $5 per ton. One mill which reduced nails to 3c. has not yet decided to put its price back to the 3.25c. price, as has been done by a Pittsburgh district mill.

Cleveland warehouses quote steel bars at 3.30c. to 3.34c.; plates, 3.60c. to 3.64c., and structural material, 3.40c. to 3.44c.; No. 9 galvanized wire, 4.70c.; No. 9 annealed wire, 3.75c.; No. 28 black sheets, 5.60c.; No. 28 galvanized, 6.95c.; No. 10 blue annealed, 4.55c.

Bolts, Nuts and Rivets.—The bolt and nut market is dull, and as a result of the cut in steel prices the market is not firm. Sales are limited to very small lots, and while no price shading is reported, it is felt that a good inquiry would bring out concessions. Manufacturers are operating their plants at 25 to 30 per cent of capacity. Rivet prices have been similarly affected. Sales of small lots of rivets are reported at concessions of $1 to $2 a ton from regular prices.

Sheets.—Competition for business has resulted in a further softening in sheet prices. Some plate mills are using the 2.25c. plate base and are quoting as low as 2.70c. for No. 10 in the heavier gages of sheets in competition with blue annealed sheets, this being a reduction of $9 a ton during the week. Independent sheet mills quote blue annealed sheets at 3.30c. to 3.40c. and black sheets at 4.10c. to 4.20c., the lower prices representing a decline of $2 a ton. Galvanized sheets are weak. On these 5.25c. has been quoted, although some mills are asking 5.35c. Resale sheets are being offered locally at 3.70c. for black, 3c. for blue annealed, and 4.85c. for galvanized.

Old Material.—There is practically no activity in the market. Dealers have very few orders on which shipments will be accepted by mills and are not in the market for scrap except for material to lay in stock. However, very little scrap is being offered, as production has been so greatly curtailed. The McKinney Steel Co. is still taking shipments of turnings for its blast furnaces, but no other local consumers are accepting shipments. Prices remain about stationary. A local mill reports the sale of a small lot of heavy melting steel at $13.50. Compressed steel has brought $11.50 for outside shipment.

Per Gross Ton

Heavy melting steel	$14.00 to $14.25
Steel rails, under 3 ft.	17.00 to 17.50
Steel rails, rerolling	17.00 to 18.00
Iron rails	17.00 to 17.50
Iron car axles	33.00 to 35.00
Low phos. melting	16.50 to 17.00
Cast borings	11.00 to 11.50
Machine shop turnings	6.00 to 7.00
Mixed borings and short turnings	10.00 to 10.50
Short turnings for blast furnaces	10.00 to 10.50
Compressed steel	10.00 to 11.00
Railroad wrought	15.50 to 16.00
Railroad malleable	16.00 to 16.50
Steel axle turnings	11.00 to 11.50
Light bundled sheet stampings	6.00 to 7.00
Drop forge flashings over 10 in.	8.00 to 9.00
Drop forge flashings under 10 in.	9.00 to 10.00
No. 1 cast	20.00 to 21.00
No. 1 busheling	9.00 to 10.00
Railroad grate bars	15.00 to 16.00
Stove plate	15.00 to 16.00
Cast iron car wheels	19.00 to 20.00
Pipes and flues	9.00 to 9.50

The Shelbyville Foundry Co., Shelbyville, Ind., has increased its capital stock from $5,000 to $50,000. The company was moved from Grennsburg to Shelbyville last September and was located in a frame building which has been remodeled and put in shape for operation. The officers include G. W. Wagner, president, Muncie, Ind., and J. E. Evans, secretary-treasurer.

G. W. Bickerton and others have incorporated the Stucco-Steel Co. at Youngstown, Ohio, for the manufacture of steel products to be used in connection with stucco work.

New York

NEW YORK, Feb. 21.

Pig **Iron.**—The market continues extremely dull, with indications of further weakening. A sale of 1000 tons of foundry grades made last week is understood to have been by a central Pennsylvania furnace at a figure equivalent to about $27, eastern Pennsylvania, for No. 2 plain, and less than $25, Buffalo, but no sales of Buffalo are reported at less than $28. Some foundries report an increase in orders for castings, but the improvement is slight.

We quote delivered in the New York district as follows, having added to furnace prices $2.52 freight from eastern Pennsylvania, $5.46 from Buffalo and $6.16 from Virginia:

East. Pa. No. 1 fdy., sil. 2.75 to 3.25.	$33.52
East. Pa. No. 2X fdy., sil. 2.25 to 2.75.	31.77
East. Pa. No. 2 fdy., sil. 1.75 to 2.25.	30.52
Buffalo, sil. 1.75 to 2.25.....	33.46 to 35.46
No. 2 Virginia, sil. 1.75 to 2.25.....	33.16 to 34.16

Warehouse Business.—Business is chiefly confined to small orders. Prices are but little changed from last week, with the exception of sheets, which are being sold in numerous instances considerably below the quotations of the leading independent and lower than the prices of Waverly warehouse, sales evidently being based on the new low quotations by independent mills. No. 10 blue annealed has been quoted at 4.50c. per lb., No. 28 black at 5.50c. per lb. and No. 28 galvanized at 6.25c. per lb.

High Speed Steel.—At least one producer of high speed steel has reduced quotations on 18 per cent tungsten high speed steel to $1.10 per lb. and while other producers quote nominally $1.25 per lb., sales are generally from $1.10 to $1.15 per lb., and some offer to sell in large lots below $1.

Finished Iron and Steel.—The only encouraging feature of local steel trade at the moment is the revival of inquiry for building construction. Fabricators and the mills making plain material have received indications in the past week from architects and builders that many projects will soon come into the market. Several large apartment buildings for New York are being discussed though formal inquiries for the steel have not been sent out. Fabricators are making low prices on steel work, and to some extent are anticipating further reductions in the price of plain material by the mills. On a theater building, for which bids were put in last week, one price was as low as $90, delivered. This is said to be close to the figure at which a considerable amount of prospective building work may be released. Among the jobs let within the past week are the following: Addition to Knickerbocker Hospital, 500 tons, to Levering & Garrigues Co.; mill building in Brazil, 500 tons, to Levering & Garrigues Co.; office building at 13 East Forty-second Street, New York, 500 tons, to Hay Foundry & Iron Works; addition to store of Oppenheim, Collins & Co., New York, 500 tons, to Hay Foundry & Iron Works. Jobs that are up for bids include 300 tons for a public school, Troy, N. Y.; 4000 tons for oil storage tanks in Oklahoma and Texas for interests affiliated with Henry L. Doherty & Co.; 2500 tons for 12 tanks for the United States Shipping Board; 250 tons for a warehouse for the Goodman Warehouse Corporation, Jersey City; 400 tons for a warehouse at Wilkes-Barre, Pa. Bids are in on four bridges over the Savannah River, three of which require about 300 tons each, and one 500 tons. The International Nickel Co. has postponed action for a few weeks on its plant at Huntington, W. Va., which will require 2500 tons. Aside from this activity in structural steel, the local market is extremely quiet. There are so few inquiries that the disposition of the mills to make attractive prices on desirable tonnage is not being fully tested. On the small lots making up the bulk of the current business it has not been necessary for the mills to go very low. For example, though there is talk that 2c., Pittsburgh, could easily be done on a sizable tonnage of plates or bars, small lots have been sold at 2.40c. for plates and 2.25c. for bars. On 1200 tons of bars for export, it is reported, but not confirmed, that 1.95c. or 1.97½c., Pittsburgh, was done, but the trade believes that a rerolling mill took this business. No new railroad car work is coming into the market, and car builders expect that this situation will exist until the labor situation on the railroads has been adjusted.

We quote for mill shipments, New York, as follows: Soft steel bars, 2.38c. to 2.73c.; plates, 2.53c. to 3.03c.; shapes, 2.53c. to 2.83c.; bar iron, flats, wider than 6 in., 3.23c., with half extras; light rounds, squares and flats, 3.73c., with full extras, and other sizes, 2.73c., with half extras.

Cast Iron Pipe.—The city of Lynn, Mass., is holding under advisement the bids recently submitted to it for 770 tons of pipe. Though the prices quoted herewith generally prevail for small tonnages, lower prices could be obtained if the inquiry were of sufficient attractiveness. We quote f.o.b. New York: 6-in. and larger, $63.30; 4-in., $73.30; 3-in., $83.30, with $4 additional for Class A and gas pipe.

Old Material.—The market is marking time, with negligible changes either up or down. The recent flurry of demand for cast scrap and specification pipe has subsided.

Buying prices per gross ton, New York, follow:

Heavy melting steel.....	$10.50 to $11.00
Rerolling rails	15.00 to 16.00
Relaying rails, nominal.....	45.00 to 47.50
Steel car axles.....	17.00 to 17.50
Iron car axles.....	33.00 to 34.00
No. 1 railroad wrought.....	15.00 to 15.50
Wrought iron track.....	10.50 to 11.00
Forge fire	9.50 to 10.00
No. 1 yard wrought, long.....	13.00 to 14.00
Light iron	5.00 to 6.00
Cast borings (clean).....	8.50 to 9.00
Machine-shop turnings	8.00 to 8.50
Mixed borings and turnings.....	6.00 to 7.00
Iron and steel pipe (1 in. diam. not under 2 ft. long).....	11.00 to 11.50
Stove plate	15.00 to 15.50
Locomotive grate bars.....	12.00 to 13.00
Malleable cast (railroad).....	13.00 to 14.00
Old car wheels.....	19.00 to 20.00

Prices which dealers in New York and Brooklyn are quoting to local foundries, per gross ton:

No. 1 machinery cast.....	$23.00 to $24.00
No. 1 heavy cast (columns, building materials, etc.), cupola size.....	22.00 to 23.00
No. 1 heavy cast, not cupola size....	13.00 to 14.00
No. 2 cast (radiators, cast boilers, etc.)	13.00 to 14.00

Philadelphia

PHILADELPHIA, Feb. 21.

Buyers continue to remain aloof, apparently being more interested in the expected change in the price policy of the Steel Corporation than in the prices which the independent mills are quoting. The price cuts by the Midvale Steel & Ordnance Co. have not brought out much business, though that company is booking in small orders about 40 per cent of the capacity of its Johnstown plant, its Coatesville plant still being idle. Other independent steel companies are somewhat slow to follow the Midvale company's lead to the fullest extent, not finding it necessary to make large concessions on the small lots which buyers are offering. There is no confirmation here of reported sales of plates and bars at 2c., Pittsburgh, but if such sales have been made, they are apparently few in number. A goodly share of the current business coming to Eastern mills is from the Central West, buyers in the East being either well stocked or are not requiring steel because of greatly curtailed operations.

In pig iron and old material there is further weakness and business is extremely quiet.

Pig Iron.—While pig iron trade is quiet, there are a few more sales of 500 and 1000-ton lots, indicating that some buyers are a little more confident as regards present quotations. One Eastern furnace took a 1000-ton order for February-March shipment at $29, base, furnace, and a 500-ton order at the same price for the same delivery. Another Eastern furnace sold 1000 tons of high sulphur iron to a pipe maker at $28, furnace. Foundry iron is available, however, at $27, base, furnace, though most sellers are still holding for $28 and $29. In basic there is no activity, but an Eastern furnace is willing to sell at $27, furnace. As it is apparent that the price obtained on the last reported basic sale, namely, $30, furnace, could not now be gotten, we revise our quotation to the $27 basis. On a substantial tonnage it is intimated that as low as $25, fur-

nace, might be done. Other grades are quiet and prices quoted are nominal.

The following quotations are for iron delivered in consumers' yards in Philadelphia or vicinity, except those for low phosphorus iron, which are f.o.b. furnace:

East Pa. No. 2 plain, 1.75 to 2.25	$28.84 to $31.54
East. Pa. No. 2X, 2.25 to 2.75 sil.	30.09 to 32.79
Virginia No. 2 plain, 1.75 to 2.25 sil.	33.74 to 35.74
Virginia No. 2X, 2.25 to 2.75 sil.	34.99 to 36.99
Basic deliv. Eastern Pa.	28.40
Gray forge	30.40 to 31.26
Standard low phos. (f.o.b. furnace)	41.50
Malleable	31.90 to 32.40
Copper bearing low phos. (f.o.b. furnace)	40.00

Ferroalloys.—Ferromanganese is quoted at from $90, for resale, to $100, delivered, for British or domestic furnace shipments. Spiegeleisen is available at $35, furnace.

Coke.—Foundry coke is obtainable at $5 and up, Connellsville, depending on the grade.

Plates.—The price of plates has not gone below 2.15c., Pittsburgh, on sales by Eastern mills, and the majority of transactions are at nearer 2.25c. The demand is very light. While there is talk of 2c., Pittsburgh, on plates, it is not confirmed that sales have been made on this basis, though a desirable specification might bring out such a quotation. On the average run of current small orders independent mills are not willing to make such a deep cut. We quote plates at 2.15c. to 2.65c., Pittsburgh.

Structural Material.—Sales of plain material are in small tonnages. The lowest price reported on any sale by an Eastern mill is 2.15c., Pittsburgh, and this has not been done frequently. Most of the sales are at 2.55c. We quote the market at 2.15c. to 2.45c., Pittsburgh.

Bars.—Various small sales of steel bars are reported at 2.10c., Pittsburgh, and upward. Demand is not active and most of the independent mills are not naming rock bottom prices on current small lots. Bar iron is still quoted at 2.35c., Pittsburgh, by leading Eastern makers, but this price would be shaded on desirable orders. We quote steel bars at 2.10c. to 2.35c., Pittsburgh, and bar iron at 2.35c., Pittsburgh.

Sheets.—A variety of prices is being made on sheets. Blue annealed has been quoted at 3.30c. to 3.40c.; No. 28 black, 4.20c. to 4.35c.; No. 28 galvanized, 5.50c. to 5.70c., all Pittsburgh base.

Bolts, Nuts and Rivets.—Further price cutting has appeared, but quoted prices are not changed by Eastern makers.

Old Material.—The scrap market is still quiet. Changes in prices are all downward. We quote for delivery at consuming points in this district as follows:

No. 1 heavy melting steel	$14.00 to $14.50
Steel rails, rerolling	18.00 to 19.00
No. 1 low phos., heavy 0.04 and under	23.50 to 24.00
Car wheels	23.00 to 24.00
No. 1 railroad wrought	19.00 to 20.00
No. 1 yard wrought	16.00 to 18.00
No. 1 forge fire	12.50 to 13.00
Bundled skeleton	12.50 to 13.00
No. 1 busheling	15.00 to 16.00
No. 2 busheling	11.00 to 12.00
Turnings (short shoveling grade for blast furnace use)	10.00 to 10.50
Mixed borings and turnings (for blast furnace use)	10.00 to 10.50
Machine-shop turnings (for rolling mill and steel works use)	12.00 to 12.50
Heavy axle turnings (or equivalent)	13.00 to 14.00
Cast borings (for rolling mills)	12.00 to 13.00
Cast borings (for chemical plants)	14.00 to 15.00
No. 1 cast	23.00 to 23.50
Railroad grate bars	16.00 to 16.50
Stove plate (for steel plant use)	16.00 to 16.50
Railroad malleable	16.00 to 17.00
Wrought iron and soft steel pipes and tubes (new specifications)	14.50 to 15.50
Iron car axles	30.00 to 31.00
Steel car axles	25.00 to 26.00

New steel rails to the amount of 95,000 tons were laid by the Pennsylvania Railroad in 1920. About 87 per cent was of the 130-lb. section. The rails cost approximately $48 per ton, which would indicate that about 83,000 were bought at about $47 and 12,000 at an average of $55 per ton.

Cincinnati

CINCINNATI, Feb. 21.

Pig Iron.—The market is extremely dull and only a few sales were reported during the week. The largest of these was for 200 tons of malleable to a central Ohio melter at $28, Valley furnace. Carload lots of foundry iron were disposed of at $30, Ironton basis, and $28, Birmingham, and one lot of low phosphorus was taken by a central Ohio melter at around $43, delivered. Inquiries before the trade include 2000 tons of foundry for the Detroit plant of the American Radiator Co., 500 tons for a northern Ohio melter, and 500 tons for a melter in the northeastern part of the State. In the absence of any quotation-making sales, last week's prices still hold, but it is generally admitted that on a bona fide inquiry for a round tonnage these would not stand. Valley interests are said to be freely quoting basic iron in this territory at $25, furnace, and it is intimated that if buyers are interested a lower price could be secured. It is reported that Southern basic could be had in this territory at a price slightly under Valley iron. A report has been in circulation that an Ohio River steel company had purchased 20,000 to 25,000 tons of basic iron from a Chicago district furnace at $25, but the interest associated with the purchase states that it has not bought any iron for the past two months.

Based on freight rates of $4.50 from Birmingham and $2.52 from Ironton, we quote f.o.b. Cincinnati:

Southern coke, sil. 1.75 to 2.25 (base)	$32.00
Southern coke, sil. 2.25 to 2.75 (No. 2 soft)	33.25
Ohio silvery, 8 per cent sil.	42.52
Southern Ohio coke, sil. 1.75 to 2.25 (No. 2)	31.52
Basic northern	29.52
Malleable	32.02

Finished Material.—There is very little activity in the finished material market, the uncertain price situation having had a tendency to keep buyers from placing any tonnages. Carload lots for immediate delivery constitute the only activity. There are rumors of sheets being offered in this market as low as 5.25c. for galvanized, and 4.15c. for black, but no records of any transactions are at hand. It is well known, however, that 4.20c. on black and 5.35c. on galvanized can be done. On bars 2.10c. appears to be the lowest price available, and even this is being made by only one independent. Some small tonnages of structural steel have been taken by a mill at a 2.25c. base. The structural steel for the Herschede office building has been awarded to the L. Schreiber & Sons Co., Cincinnati. This involves about 350 tons. On five barges for the Government service on the Ohio River, involving 350 tons, it is understood that the contract has gone to a Tennessee fabricator. Bids are being taken on 100 tons of steel for Lock No. 45, Ohio River, near Addyston. Several projects involving considerable tonnages of reinforcing bars will shortly be up for bids.

Warehouse Business.—Local warehouses report no change in conditions during the week. Small tonnages for immediate shipment, with an occasional carload inquiry, is about the only market activity. Local warehouse stocks are now in good shape, with the exception of some sizes of pipe, and this condition is being relieved by shipments from mills. Prices are the same as last week, as follows:

Iron and steel bars, 3.58c. base; shapes, 3.68c. base; hoops and bands, 3/16 in. and lighter, 4.28c.; plates, 3.88c. base; reinforcing bars, 3.65c.; cold-rolled rounds, 1⅞ in. and over, 5.20c.; under 1½ in. rounds, flats, squares and hexagons, 5.70c.; No. 10 blue annealed sheets, 4.78c. base; 28-gage black sheets, 6c. base; 28-gage galvanized sheets, 7c. base; wire nails, $4 per keg, base.

Coke.—Conditions in the coke market are similar to those prevailing in iron. Occasional sales of foundry coke for spot shipment are being made at the prices ruling a week ago. We note one sale of 500 tons of New River foundry coke to a Western plant at $11, ovens. Wise County furnace coke was offered last week at $6.50, but foundry remains at $8.

Old Material.—The scrap market is inactive and weak. Cast borings were purchased in the local market last week at $6. Dealers are still inclined to buy at present prices, but with more of the local foundries out

of the market, and steel plants practically idle, sales are negligible. Quotations remain unchanged.

We quote dealers' buying prices:

	Per Gross Ton	
Bundled sheets	$7.50 to	$8.50
Old iron rails	16.50 to	17.50
Relaying rails, 50 lb. and up	40.50 to	41.50
Rerolling steel rails	12.50 to	13.50
Heavy melting steel	11.50 to	12.50
Steel rails for melting	11.50 to	12.50
Car wheels	16.50 to	17.50
	Per Net Ton	
No. 1 railroad wrought	11.50 to	12.50
Cast borings	6.50 to	7.00
Steel turnings	4.00 to	4.50
Railroad cast	15.50 to	16.50
No. 1 machinery	15.50 to	16.50
Burnt scrap	8.50 to	9.50
Iron axles	23.00 to	23.50
Locomotive tires (smooth inside)	11.00 to	12.00
Pipes and flues	7.50 to	8.00
Malleable cast	10.50 to	11.00
Railroad tank and sheet	6.50 to	7.00

British Iron and Steel Market

Trade Stagnant, With Operations Much Hampered by Continental Competition

(*By Cable*)

LONDON, ENGLAND, Feb. 21.

Though no more Cleveland furnaces have been blown out, the situation is increasingly serious, as consumers are purchasing Continental pig iron freely. Midland prices are lower, with no change in Cleveland. Hematite iron is slack, as buyers are apparently waiting for further price concessions. While there are some inquiries for export, adverse exchange rates are hampering business.

The foreign ore market is stagnant, some consumers being unable to take up deliveries. Sellers of Bilbao Rubio ore ask 40s. ($7.76) ex-ship Tees.

Coke demand is slow, with unchanged prices. Steel prices are easier, but there is little disposition on the part of consumers to take advantage of them, owing to cheap Continental offerings. Continental billets are offered at £9 ($34.92) delivered in Glasgow. Belgian bars are quoted at £11 10s. ($44.62) c.i.f. United Kingdom. Australia is inquiring for 8000 tons of plates, but it is anticipated that the order will be placed in the United States. Brazil purchased 7000 tons of rails in Luxemburg.

Tin plates are weak, on forced sale, selling down to 28s. 6d. ($5.53) base, f.o.b. works, accepted for prompt delivery. Wasters down to 15s. ($2.91). There is some talk of reviving the Central selling scheme. Galvanized sheets of No. 24 gage have been sold to India at £25 ($97.00) f.o.b. works. Inquiry is better, but there is little business.

Improvement Still Lacking—Coal Trade at a Standstill—Record in Shipbuilding

London, England, Feb. 3.—No improvement is as yet perceptible. Prices continue to decline and seem likely to continue. Living costs are gradually becoming more reasonable although still high on the whole. The last official index figure was 164 per cent which compared with 169 on Dec. 1, and 176 on Nov. 1.

Discussions still continue on the unemployment problem; the idea of labor itself on the subject is the enforcement of a 44-hr. week, £2 per week unemployment benefit, and compulsory education up to the age of 16, the last mentioned idea being with the object of prolonging the period of education and so reducing competition in the labor market. The labor men, however, themselves apparently hardly expect the government to adopt their schemes, and when the delegates' conference meets again on Feb. 23, it will be concerned mainly with the issue as to whether direct action shall be adopted. What labor overlooks, or at least ignores, is the amount of time which is lost by strikes. During last year strikes were responsible for the loss of 27,000,000 working days. Wage increases obtained during 1920 by 7,600,000 workers reached the total of £4,700,000 per week. The hours of 560,000 workers were reduced by 2,085,000 per week.

The coal trade has not been having a happy time lately owing to the restriction of demand by means of the slowing down of industry here, and the reduction of outlet in overseas markets. Welsh colliery owners and ship-owners seem to have definitely concluded that it is no use supplying coal or tonnage below costs, and that if they are to save their enterprises from bankruptcy they must make a firm stand. Ship owners have been laying up steamers for some time past and, although many have been sent to safe harbors elsewhere, there are still nearly 200 vessels laid up in the principal Welsh ports. The output in the coal industry in the West of Scotland generally now appears to have returned to normal. Instead of a scarcity there is now a surplus, but this, of course, is due in part to depression in other industries.

In regard to the pig iron markets further reductions have been made in the prices of Cleveland. Home trade prices are down 20s. with a 5s. premium for export; these reductions were anticipated, but do not seem to have tempted buyers to enter the market. Stocks of pig iron are accumulating and, as there is no pig iron warrant market for producers to fall back upon to finance their output, the furnaces will probably have to be damped down.

In regard to the finished iron and steel trades there is not much change in prices, and not much improvement in business.

The annual summary of shipbuilding for last year is interesting. It shows the output of the United Kingdom at 2,055,264 tons, which is the highest ever reached. It exceeds the previous year's total by over 26 per cent, and is 142,371 tons higher than the previous record of 1913. In the United Kingdom there were launched 168 vessels of between 5000 and 10,000 tons and 15 vessels of 10,000 tons upwards, the largest being the *Empress of Canada* of 22,000 tons. There were also launched 11 vessels of about 65,400 tons for the carriage of oil in bulk.

There is still, of course, a fair amount of shipbuilding work on hand but new orders can hardly be expected to come along in view of the dumping of German vessels on the market at prices which no firm can hope to compete with. The price at which the government is disposing of the German ships is £9 per ton.

We quote per gross ton except where otherwise stated, f.o.b. maker's works, with American equivalent figured at $3.88 per £1, as follows:

Midland coke	£	2	14½					$10.57	
Cleveland basic		9	0	to £	9	5*		34.92 to	$35.89
Cleveland No. 1 foundry		10	0	to	10	5*		38.80 to	39.77
Cleveland No. 3 foundry		9	15	to	10	0*		37.83 to	38.80
Cleveland No. 4 foundry		9	14	to	9	19*		37.64 to	38.61
Cleveland No. 4 forge		9	12½	to	9	17½*		37.35 to	38.32
East Coast mixed		11	0					42.68	
East Coast hematite		12	0					46.56	
West Coast hematite		12	0					46.56	
Ferromanganese		24	10	to	25	0*		95.06 to	97.00
Ship plates		21	10	to	23	0		84.32 to	89.24
Boiler plates		27	0	to	29	0		104.76 to	112.52
Tees		20	0	to	21	0		77.60 to	81.48
Channels		19	5	to	20	5		74.69 to	78.57
Beams		19	0	to	20	0		73.72 to	77.60
Round bars, ¾ to 3 in.		19	0	to	22	0		73.72 to	85.36
Rails, 60 lb. and up		21	0	to	23	0		81.48 to	89.24
Billets		14	10					56.26	
Sheet and tin plate bars, Welsh		14	0	to	14	10		54.32 to	56.26
Galvanized sheets, 24 g.		25	0	to	26	0		97.00 to	100.88
Black sheets		24	0	to	25	0		93.12 to	97.00
Tin plate base box		1	8	to	1	12		5.43 to	6.21
Steel hoops		27	0					104.76	

*Export price.

The McClintic-Marshall Co., which has been occupying temporary offices in the Statler Hotel, Cleveland, since it opened an office in that city several months ago, will move to its new offices, 1538 Hanna Building, this week.

BUILDING ACTIVITY

Conference in Philadelphia to Study Conditions and Remedies

A conference on the "Situation in the Construction Industry" was held in Philadelphia by the city government and the Philadelphia Chamber of Commerce, Feb. 15, 16 and 17. The conference was attended by employers' and employees' representatives in the building trades, bankers, manufacturers and public officials. Public works, transportation, fuel, building costs, wages and production per man, financial considerations and unemployment were discussed, and at the closing session resolutions were adopted calling for further conferences and the establishment of a national conference on building construction.

A. J. County, vice-president, Pennsylvania Railroad, speaking of slackness in building and the need for higher railroad rates, said that at present he estimated that some 300,000 railroad cars are idle, as compared with a shortage of about 60,000 cars a year ago.

"The public," said Mr. County, referring to building costs, "is advised of reduced prices for cement, copper, lumber, brick, leather, coal, steel and other items; it believes they must go lower, and it wants a substantial cut in building costs. We may, however, make it clear to the public that if it is holding back from building operations in the hope of 1916 prices it will be disappointed. No man can tell how long present conditions are going to stay, but it is safe to say that while the sunshine will occasionally peep through the clouds, present conditions will not be over in a couple of months."

Comparative Building Costs

Joseph M. Steele, William Steele & Sons Co., pointed out that from 1909 to 1914 building construction costs advanced about 44 per cent, while from 1914 to 1920 they advanced 240 per cent. Wages during the past year, he said, had increased from 40 to 50 per cent, while the pre-war worker was 25 per cent more productive than the workman of to-day.

During the second day's session, building trades employers came directly to the point of wage reductions and generally agreed that, with a revival of construction, a reduction of about 23.93 per cent would be made from the peak of high wages in 1920. Arthur G. Hawes, president of the Associated Building Trades Council, in reply, said:

"Don't start on the working men. If there is going to be a reduction, let it be all along the line. If you can give us a guarantee that all are going to take reductions, including the banker, the material manufacturer, the material dealer, the general contractor, the sub-contractor, the architect and the engineer, then I'll say 'amen.' If you can't do that, we'll say 'nothing to it.'" P. H. Kelly, for many years business agent of the Journeyman Bricklayers' Union, however, advocated acceptance of a reduced wage scale, pointing out that it was to the most selfish interest of the workers to accept the reduction.

Presenting the building employers' side of the case, Thomas Evans, Merchant & Evans Co. and the Globe Automatic Sprinkler Co., said: "The employer and the wage-earner are in exactly the same condition. Neither has any work or prospects for 1921. The employer is willing to take work for just about expenses. Labor must do its share. What the worker gives up is not going to the employer. It is going to no one.

"It may be asked how it is expected that labor, by remaining as it would, at about 73 per cent above the 1914 rates, can produce buildings at a lower percentage of increase over 1914 prices than that percentage of wage boost. The answer is that we expect labor to give greater production per capita, thereby decreasing the total labor proportion of the cost of building."

Mr. Evans attacked the position of the dealers in building materials. "A study of commodity prices and fluctuations shows," he said, "that taking standard market prices, all building materials classified together show an increase over 1914 prices of more than 150 per cent on Jan. 29. There have been reductions since, but the cement, brick, lumber, sand and steel manufacturers together are holding a higher level of increase over 1914 prices than any other group of commodities except oil and coke."

On the third day of the convention resolutions calling for further conferences and the establishment of a conference of nation-wide scope were adopted, on motion of Arthur G. Hawes, president, Associated Building Trades Council. These resolutions set forth that

"(a) Current costs of construction materials still remain much and erratically higher as compared with pre-war costs and as compared with the average of all other commodities.

"(b) Current construction labor costs have not had proper adjustment to accord with present conditions.

"(c) Practices and conditions surrounding financing of building construction require modification.

"(d) Relations between employers and employees call for improvement and stabilization to assure continuity of operations in all building construction; and

"(e) Employers and contractors have not progressed to the needed extent in effecting reasonably prompt deflation of values throughout the construction industry (and all stages thereof from raw materials to finished products, including their own overhead and profit).

"Stabilization on a properly deflated basis of many important elements in building construction (such as steel, cement, lumber, brick, fuel, transportation, etc.) requires national solution for local application.

"Therefore be it resolved, That the industrial relations committee of the Philadelphia Chamber of Commerce is hereby urgently requested to give immediate effect to the following:

"(a) That detailed conferences be held in Philadelphia between labor, employers, material interests, financial interests, architects and engineers at once with the purpose of reaching an understanding among all concerned which will cause the immediate release of contracts for building construction; and to this end that architects and engineers be urged to list the building projects of their clients.

"(b) That the record of this conference—with the proper digest of all its papers and statements—be at once edited, printed and distributed to interested groups in all centers throughout the country.

"(c) That a national conference be effected immediately for national stabilization of views and purposes in the building industry, based on the facts and conditions presented at this Philadelphia conference."

Congress Fails to Support Council of National Defense

WASHINGTON, Feb. 22.—Failure of Congress to appropriate for its support during the next fiscal year will force the Council of National Defense out of existence unless private interests come to its support. That they will do so has been indicated, it being realized that this organization has been engaged in important industrial research work and in maintaining departments for the preparation of valuable statistics, such as those relating to production. It has been pointed out that if there should be a lapse of time during which the work of the council was halted, even though it resumed work, it would be difficult to overcome the loss of time and bring its statistical compilations up-to-date, as well as suffering from the disbandment of its organization.

It was the council which was the forerunner in preparing the country for war, having been organized well in advance of the period of hostilities. Around it were built the great civilian war-time organizations, including such bodies as the War Industries Board, and State councils throughout the country, and its widespread affiliations included prominent people in all vocations of life, mostly at $1 a year.

Congress as a whole has recognized, though perhaps not adequately appreciated, the work of the council, and its failure to appropriate appears to be due chiefly to one disgruntled member, strange as that seems.

Research work, virtually the primary undertaking of the body since shortly after the armistice, useful both for peace-time and war-time purposes, already has been abandoned.

REPUBLIC COMPANY EARNINGS

Marked Improvement Noted in 1920 Over Previous Year—Production Greater

The Republican Iron & Steel Co. in 1920 did a gross business of $76,342,219, contrasted with $45,872,344 in 1919, and $75,224,110 in 1918. Its net profits after allowing for depreciation, all charges and federal taxes, amounted to $7,616,522, which, after deducting the preferred dividend requirements, are equal to $19.55 a share on the corporation's $30,000,000 outstanding common stock. In 1919, the company earned $1.43 a share on its then $27,272,000 common stock. The income accounts for the past two years follow:

	1920	1919
Net earnings	$13,825,521	$4,456,341
Other income	348,642	575,496
Total profit	14,174,163	5,031,837
Depreciation	1,506,260	1,381,220
Min. exch.	508,062	460,905
Federal tax, etc.	1,812,835	315,113
Inv. red.	1,992,517	.....
Interest	737,967	733,403
Balance	7,616,522	2,141,196
Preferred dividends	1,750,000	1,750,000
Common dividends	1,800,000	1,632,687
Surplus	4,066,522	*1,241,491
Previous surplus	33,880,972	35,122,462
Total surplus	37,947,494	33,880,971
Written off	†505,923	.....
Profit and loss surplus	37,441,571	33,880,971

*Deficit. †For 1917 taxes.

Additions to the property account last year aggregated $4,962,668. No additions were made to the company's production furnaces, but various improvements were made to its plants. Theoretically, the company's blast furnace capacity is 1,425,000 tons. No improvements of importance were made at the Bessemer plant, but its efficiency was maintained by liberal expenditures in repairs and upkeep. The improvements mentioned in the company's 1919 report, as concerned the open-hearth steel works, were completed in 1920. The 1920 production, in tons, with comparisons follows:

	1920	1919
Coal, net tons	2,195,912	1,942,067
Iron ore, gross tons	1,677,699	1,272,707
Coke, net	980,484	959,602
Limestone, gross	58,462	47,955
Pig iron, gross	972,188	791,597
Bessemer steel ingots, gross	502,177	433,687
Open-hearth steel ingots, gross	482,776	318,730
Total steel ingots, gross	984,953	752,417
Finished and semi-finished products, net	1,004,189	702,040

For the year ended Dec. 31, last, the company expended $28,972,720 for labor, bringing the average wage per man up to $2,190. In 1919, the wage bill was $21,466,605, and the average per man, $1,822, while in 1918, it was $23,747,260 and $1,619, respectively.

At the close of 1920, the company had 162,906 tons of finished and semi-finished business on its books, contrasted with 389,524 tons at the close of 1919, and 143,383 at the close of 1918. On Dec. 31, last, it had 35,772 tons of unfilled pig iron business on its books, as against 96,855 tons at the end of 1919, and 63,132 tons at the close of 1918.

John A. Topping, chairman of the board, said in the report that sales were on an increasing scale up to and throughout the third quarter of the year, with resulting higher prices. "Late in the year," he added, "there was a sharp decline in the demand for our products, both at home and abroad, which was a general condition affecting not only steel, but all other commodities. This situation precipitated cancellation of orders and a heavy contraction in our business, with the result that the earnings for the fourth quarter were not only affected by reduced shipments, but also by losses due to shrinkage of inventory values and other adjustments, all of which are reflected in our income statement for the year."

National Acme Mfg. Co. Earnings

The National Acme Mfg. Co., Cleveland, in a statement to its stockholders, issued Feb. 18 by its president, A. W. Henn, announced that with the exception of the last eight or ten weeks of 1920, sales and production in both its machinery and products departments were satisfactory. After deducting 1920 taxes, earnings for the year were approximately $2,500,000. Dividend requirements at 7 per cent were $1,750,000, leaving a balance of $750,000, or 43 per cent of the amount of dividend for surplus.

Attention was called to the fact that expenditures for extraordinary development and future expansion were heavy during the year. This included $450,000 for housing facilities at its Windsor plant, where 108 homes were provided for workmen, $900,000 for extensions to the Cleveland and Windsor plants, $1,000,000 for equipment for upset product at the Colt plant, Cleveland, and also equipment for other plants, $225,000 for additional acreage purchased adjoining the Colt plant for future development, making the dividends and development expenditures $4,325,000. The company's inventory increase over the previous year, after making allowances for lower market values, was placed at $2,500,000, making a total for dividends, development and increased inventory, of $6,825,000.

Giving consideration to the existing conditions and to the fact that the company is now borrowing to a fairly large extent, the directors at a meeting Feb. 18 decided that the stockholders' interests would be best conserved by passing the current dividend. Mr. Henn's letter stated that, exclusive of patents and good will, the book value of the company's stock on Dec. 31 was approximately $32 per share.

SHORT TRADE ITEMS

The complete business of the George B. Limbert Co., Chicago and East Chicago, is being offered for sale by the Northern Trust Co., trustee, as provided in the will of the late George B. Limbert. The physical valuation just made by the Sessions Engineering Co. shows a property of about $1,500,000 value at present prices. Mr. Rockwell, Northern Trust Co., as trustee, is representing the estate in the negotiations.

The Andrew Carrigan Co., Rialto Building, San Francisco, has been appointed California district sales agent of the Wyckoff Drawn Steel Co., Pittsburgh. The California district territory comprises the states of California, Wyoming, Colorado, Washington, New Mexico, Arizona and Texas. Andrew Carrigan, head of this firm, has been identified with the iron and steel trade on the Pacific Coast for more than 30 years and formerly was associated with the iron and steel jobbing firm of Dunham, Carrigan & Hayden, San Francisco. The Wyckoff Drawn Steel Co. also announces the appointment of George F. Thompson & Co., Central Building, Seattle, Wash., as its sales agents in Oregon and Washington.

The Western Tool & Mfg. Co., Springfield, Ohio, has established a New York office at 25 Park Place; telephone, Barclay 3610.

H. B. Walmsley, temporary receiver of the Nickel-Alloys Co., 140 North Broad Street, Philadelphia, has retired from that capacity and Joseph Gilfillan has been appointed permanent receiver, his address being West End Trust Building, Philadelphia.

F. J. Ryan & Co., Franklin Trust Building, Philadelphia, specialists in electric heating problems in both the chemical and metallurgical industry, have elected the following departmental executives: S. H. Ourbacker, director of engineering; F. A. Hall, director of sales; T. B. Bechtel, director of construction. F. J. Ryan & Co. were organized by Mr. Ryan, who has been allied with the electric furnace development since its commencement in this country. The original company was organized in 1913, but was inactive for three years when he occupied the position of director and general manager of the Electric Furnace Construction Co., and later as directing manager of the American Metallurgical Corporation, the active business of which was terminated last October when F. J. Ryan & Co. were incorporated. The remaining contracts of the American Metallurgical Corporation have been completed by the new organization and practically all of the executives of the old organization have become members of the new. Henceforth the new organization will specialize exclusively in electro-metallurgy and electro-chemistry. Departments for the manufacture of their own low temperature ovens have been added, and structural and machine divisions created through associations with Philadelphia shops. A New York office was opened recently at 21 East Fortieth Street under the direction of E. C. Melby who will have supervision over the New York district and export field. His previous experience was in the export trade, specializing with the Scandanavian countries.

The Pittsburgh Steel Co. reports sales for the six months ending Dec. 31, 1920, to have been $18,077,585, as compared with $11,236,503 in the same period in 1919, an increase of $6,841,082. Net profits for the six months, after writing down the inventory and making other adjustments amounting to $927,068, were $1,769,700 as compared with $50,726 in the same six months in 1919, an increase of $1,718,975.

The Sullivan Machinery Co., manufacturer of mining and stone crushing machinery, Peoples Gas Building, Chicago, showed net earnings of $2,342,492 in 1920, as compared with $2,160,888 in 1919. Surplus for the year after all deductions and dividends totaled $761,076, as against $752,074 for the preceding year. Total surplus is now $3,757,029.

IRON AND INDUSTRIAL STOCKS

Market Values Continue Irregular and as a Whole Are Higher

Market values of securities continue irregular, and as a whole are higher than a week ago. This showing in the face of an increasing car surplus, weakness in grains and cotton, renewed downward tendency in hides, and the fact that surplus funds continually are absorbed by offerings of foreign and domestic bond and note issues, thereby keeping going money rates comparatively high, together with the recent action of the foreign exchange market, is difficult to analyze, especially as the average slightly higher range of security market values does not signify much confidence in our industrial future. In all fairness, however, it should be said they do not reflect any marked degree of uncertainty in the future. As a matter of fact, prices for iron and industrial stocks are moving about within a narrow circle.

As a group, the copper stocks have shown the greatest weakness during the past week, possibly because the recent underwriting of our surplus stocks failed to stimulate a demand for the red metal. The earning capacity of the producers therefore automatically reverts to the doubtful class. The best that can be said of the steel issues is they have held their own, the Steel Corporation's stand on prices unquestionably having a reassuring influence on investors. Automobile and allied issues have acted comparatively well, based on slightly more encouraging reports regarding future business. Electrical equipment shares are stronger than most industrial, notwithstanding a decided slump in their bookings the past few months. With the exception of Reading, rails hold well, presumably due to a belief a readjustment in labors' wages is in the making. The Reading dissolution plan evidently is distasteful to some investors.

The range of prices on active iron and industrial stocks from Saturday of last week to Monday of this week was as follows:

Allis-Chalm. com. 35	- 37¾	Lack. Steel.....	54⅝ - 56½
Allis-Chalm. pf.. ..	- 81	Midvale Steel....	30⅝ - 31½
Am. Can com...	29½ - 30⅞	Nat.-Acme	21¼ - 24⅜
Am. Can pf.....	85¾ - 86¾	Nat. E. & S. com.	63¾ - 65
Am. C. & F. com.	122¾ - 124	N. Y. Air Brake.	83¾ - 89
Am. C. & F. pf.. ..	-113	Nova Scotia Steel	36½ - 37¾
Am. Loco. com..	83¾ - 86⅝	Press. Steel com.	92 - 95¼
Am. Rad. com...	71½ - 72	Press. Steel pf...	95½ - 96
Am. Stl. F. com.	30 - 30⅝	Ry. Stl. S. com..	84⅞ - 87½
Am. Stl. F. pf...	89 - 89¼	Ry. Stl. S. pf... ..	-106
Bald. Loco. com.	89½ - 92⅞	Replogle Steel...	31½ - 32½
Bald. Loco. pf...	100¼ - 102	Republic com. ..	65¾ - 68⅝
Beth. Steel com..	53⅛ - 55⅞	Republic pf.	95 - 96
Beth. Steel Cl. B	56⅜ - 59	Sloss com.	50¾ - 52
Beth. Stl. 8% pf..	105¼ - 106	Superior Steel...	41⅛ - 42
Chic. Pneu. Tool	65½ - ..	Trans.-Williams..	39¾ - 41
Colo. Fuel	27½ - 28½	Un. Alloy Steel..	32¼ - 32⅞
Cruc. Steel com..	93 - 97¼	U. S. Pipe com..	12½ - 14¾
Cruc. Steel pf... ..	- 89	U. S. Pipe pf....	45¼ - 45¾
Gen. Electric ...	128¼ - 132½	U. S. Steel com..	82½ - 85
Gt. No. Ore Cert.	29⅝ - 30⅛	U. S. Steel pf...	110 -111
Gulf States Steel	31½ - 33½	Vanadium Steel..	35¾ - 37¾
Int. Har. com...	95 -100	West'ghouse Elec.	44⅞ - 46⅜

Newton Steel Co.'s Annual Meeting

At the annual meeting of the Newton Steel Co., by-laws were amended making Youngstown, Ohio, its principal place of business instead of Newton Falls, Ohio, where its plant is located. The president's report showed that the company produced about 32,000 tons of sheets last year and shipped 30,000 tons. Though the plant was started in April, 1920, it did not get under full headway until about June 1. For several months, the company's executive offices have been located in the Wick Building in Youngstown.

Shareholders elected the following directors: Edward Ford Clark, Harold A. Taylor, H. M. Steele, J. H. Fitch, Jr., John Ford of Youngstown and W. H. B. Ward and George T. Fillius of Warren. Directors chose these officers: President, Edward Ford Clark; first vice-president in charge of sales and purchases, J. H. Fitch, Jr.; second vice-president in charge of operations, H. M. Steele; secretary-treasurer, R. A. Kenworthy. John Stambaugh, Jr., has retired as secretary, while Mr. Fitch was formerly treasurer. Mr. Kenworthy was formerly general sales manager.

L. J. Harrison, who has been assistant sales manager, has been promoted to general sales manager. Mr. Harrison has been with the company since the Spring of 1920 and was for a time in charge of the Chicago district office. He was previously in the sales department of the Allegheny Steel Co. of Pittsburgh.

D. H. McVay, formerly in the main office of the Allegheny Steel Co., has joined the sales organization of the Newton company and will be given charge of the Chicago office.

The company also operates a branch office in Detroit, with H. B. MacGregor in charge and another in Cleveland, with Howard Kenworthy in charge.

The Newton Steel Co. operates a highly modern plant, consisting of eight stands of roughing mills and eight stands of finishing mills, on a 150 acre site.

It specializes in the manufacture of high-grade sheets for the automobile, steel furniture and Pullman trades and has an annual productive capacity of 50,000 tons of finished product. Its outstanding capital consists of $705,000 of preferred and $1,350,000 of common stocks.

Falcon Steel Co. Earnings

President Lloyd Booth informed stockholders of the Falcon Steel Co., at the yearly meeting Feb. 15, that net earnings in 1920, after dividends, depreciation and reserves for federal taxes, amounted to $888,000. The company shipped 42,000 tons of black and blue annealed sheets from the time its plant started production on March 1 until the close of the year. A three-pot galvanizing department was completed during the latter part of 1920.

The by-laws were changed to have the annual meeting hereafter on the fourth Tuesday in September, instead of in February, so as to accord more closely with the end of the fiscal year, June 30.

In his statements to shareholders, Mr. Booth stated he thought the bottom had not yet been reached in the sheet market and it would be several months before profitable operations would appear.

The plant and general offices are located at Niles, Ohio, on a 114-acre tract, and the present plant consists of seven sheet mills and one jobbing mill, with roughing mills, cold mills, pickling and galvanizing equipment necessary for the production of 80,000 tons of black, blue annealed and galvanized sheets annually.

Directors, who were re-elected, are Lloyd Booth, Paul Wick, W. J. Hitchcock, Porter Pollock and Charles S. Thomas. Officers are: President and treasurer, Lloyd Booth; vice-president and secretary, Paul Wick; general superintendent, W. W. Lewis.

Earnings of the Pressed Steel Car Co.

The Pressed Steel Car Co. had a surplus after charges and taxes of $2,531,805 for 1920, equal after preferred dividends to $13.25 a share on the $12,500,000 common stock, against $4,265,232, or $27.12 the year before. Profits, before deduction of depreciation, etc., amounted to $3,194,277. The surplus for the year was $656,805.

Action on the ratification of the recapitalization plan, including the increase in the authorized common stock from $12,500,000 common stock of $100 par value to $50,000,000, the exchange of $12,500,000 preferred stock for an equal amount of common stock and the declaration of a 20 per cent common stock dividend, to be participated in by both common and preferred stock, has been postponed until March 2.

Railroad Situation Reflected in Baldwin Report

With gross sales of $73,542,666, and net profits of $4,428,519, the 1920 report of the Baldwin Locomotive Works shows, after all charges and provisions for preferred stock dividends, $15.14 a share earned on that corporation's $20,000,000 common stock. In the previous year the gross earnings were $84,307,776, the net profits $5,776,243, and the earnings on the common stock $21.88 a share. The profit and loss surplus at the close of last year stood at $11,013,437; on Dec. 31, 1919, it was $6,554,413.

The 1920 report is an unusual one inasmuch as it shows, for the first time, business transacted on a cash basis and that handled on a deferred basis. The balance sheet clearly indicates the inability of the railroads to pay their equipment bills, the bills receivable item standing at $28,800,000, contrasted with $10,400,000 at the close of 1919.

Report of National Enameling & Stamping Co.

Earnings of the National Enameling & Stamping Co. suffered a decline in 1920 according to the annual report. Net income, after deductions for charges, depreciation, interest, sinking fund allotment and Federal taxes, was $3,362,151, equivalent after preferred dividends to $17.07 a share on the $15,591,800 common stock, comparing with $3,807,073 or $20.25 a share the previous year. Net profits before Federal taxes and deductions for bond interest and the sinking fund, but after depreciation charges, were $4,229,503, a decrease of $649,193.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

Freight Rates

Freight rates from Pittsburgh on finished iron and steel products, in carload lots, to points named, per 100 lb., are as follows:

Philadelphia	$0.35	St. Paul	$0.695
Baltimore	0.335	Omaha	0.815
New York	0.38	Omaha (pipe)	0.78
Boston	0.415	Denver	1.35
Buffalo	0.295	Denver (wire products)	1.415
Cleveland	0.24	Pacific Coast	1.665
Cincinnati	0.33	Pacific Coast, ship plates	1.335
Indianapolis	0.345	Birmingham	0.765
Chicago	0.38	Jacksonville, all rail	0.555
St. Louis	0.475	Jacksonville, rail and water	0.46
Kansas City	0.815	New Orleans	0.515
Kansas City (pipe)	0.78		

The minimum carload to most of the foregoing points is 36,000 lb. To Denver the minimum loading is 40,000 lb., while to the Pacific Coast on all iron and steel products, except structural material, the minimum is 80,000 lb. On the latter item the rate applies to a minimum of 50,000 lb., and there is an extra charge of 9c. per 100 lb. on carloads of a minimum of 40,000 lb. On shipments of wrought iron and steel pipe to Kansas City, St. Paul, Omaha and Denver, the minimum carload is 46,000 lb. On iron and steel items not noted above the rates vary somewhat and are given in detail in the regular railroad tariffs.

Rates from Atlantic Coast ports (i.e., New York, Philadelphia and Baltimore) to Pacific Coast ports of call on most steamship lines, via the Panama Canal, are as follows: Pig iron, 55c.; ship plates, 70c.; ingot and muck bars, structural steel, common wire products, including cut or wire nails, spikes and wire hoops, 75c.; sheets and tin plate, 60c. to 75c.; rods, wire rope, cable and strands, $1; wire fencing, netting and stretcher, $1.20; pipe, not over 8 in. in diameter, 85c.; over 8 in. in diameter, 2½c. per in. or fraction thereof additional. All prices per 100 lb. in carload lots, minimum 40,000 lb.

Structural Material

I-beams, 3 to 15 in.; channels, 3 to 15 in.; angles, 3 to 6 in., on one or both legs, ¼ in. thick and over, and zees, structural sizes, 2.15c. to 2.45c.

Wire Products

Wire nails, $3.10 to $3.25 base per keg; galvanized, 1 in. and longer, including large-head barbed roofing nails, taking an advance over this price of $1.50 and shorter than 1 in., $2; bright Bessemer and basic wire, $3.00 to $3.25 per 100 lb.; annealed fence wire, Nos. 6 to 9, $3.00 to $3.25; galvanized wire, $3.70 to $3.95; galvanized barbed wire, $3.85 to $4.10; galvanized fence staples, $3.85 to $4.10; painted barbed wire, $3.25 to $3.40; polished fence staples, $3.25 to $3.40; cement-coated nails, per count keg, $2.85; these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days, net, less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 58 to 60½ per cent off list for carload lots, 57 to 59½ per cent for 1000-rod lots, and 56 to 58½ per cent for small lots, f.o.b. Pittsburgh.

Bolts, Nuts and Rivets

Large structural and ship rivets.....$3.90
Large boiler rivets.....4.00
Small rivets.....60 and 10 per cent off list
Small machine bolts, rolled threads
60, 10 and 10 per cent off list
Same sizes in cut threads.....60 and 10 per cent off list
Longer and larger sizes of machine bolts...60 per cent off list
Carriage bolts, ⅜-in. x 6-in.:
Smaller and shorter, rolled threads.....60 per cent off list
Cut threads.....50 and 10 per cent off list
Longer and larger sizes.....50 and 10 per cent off list
Lag bolts.....65 per cent off list
Plow bolts Nos. 1, 2 and 3 head...50, 10 and 5 per cent off list
Other style heads.....20 per cent extra
Machine bolts, c.p.c. and t. nuts ⅜-in. x 4-in.:
Smaller and shorter.....45, 10 and 10 per cent off list
Longer and larger sizes.....40, 10 and 5 per cent off list
Hot pressed sq. or hex. blank nuts.....$3.25 off list
Hot pressed nuts, tapped.....$3.00 off list
C. p. c. and t. sq. or hex. nuts, blank.....$3.10 off list
C. p. c. and t. sq. or hex. nuts, tapped.....$2.85 off list
Semi-finished hex. nuts:
¼ to 9/16 in. inclusive U. S. S.....80 per cent off list
Same sizes S. A. E.....80 and 10 per cent off list
⅝ to 1 in. inclusive U. S. S. and S. A. E.,
70 and 10 per cent off list
Stove bolts in packages.....75, 10 and 12½ per cent off list
Stove bolts in bulk.....75, 10 and 10 per cent off list
Tire bolts.....60, 10 and 10 per cent off list
Track bolts.....5.50c. base

Square and Hex. Head Cap Screws

½ in. and under.....65 and 10 to 70 per cent off list
9/16 in. to ¾ in.....65 to 70 per cent off list

Set Screws

½ in. and under.....70 and 5 to 70 and 10 per cent off list
9/16 in. to ¾ in.....65 and 10 to 70 per cent off list

One cent per lb. extra for less than 200 kegs. Rivets in 100-lb. kegs, 25c. extra to buyers not under contract; small and miscellaneous lots less than two tons, 25c. extra; less than 100 lb. of a size, or broken kegs, 50c. extra.

All prices carry standard extras f.o.b. Pittsburgh.

Wire Rods

No. 5 common basic or Bessemer rods to domestic consumers, $52 to $57; chain rods, $52 to $57; screw stock rods, $57 to $62; rivet and bolt rods and other rods of that character, $52 to $57; high carbon rods, $63 to $75, depending on carbons.

Railroad Spikes and Track Bolts

Railroad spikes, 9/16-in. and larger, $3.65 per 100 lb. in lots of 200 kegs of 200 lb. each or more; spikes, ½-in., ⅝-in. and 7/16-in., $4.50; 5/16-in., $5.25. Boat and barge spikes, $4.50 per 100 lb. in carload lots of 200 kegs or more, f.o.b. Pittsburgh. Track bolts, $5.50 base per keg of 200 lb. Tie plates, $2.75 per 100 lb.

Terne Plates

Prices of terne plates are as follows: 8-lb. coating, 200 lb., $13.80 per package; 8-lb. coating, I. C., $14.10; 12-lb. coating, I. C., $15.80; 15-lb. coating I. C., $16.80; 20-lb. coating, I. C., $18.05; 25-lb. coating, I. C., $19.30; 30-lb. coating, I. C., $20.30; 35-lb. coating, I. C., $21.30; 40-lb. coating, I C., $22.30 per package, all f.o.b. Pittsburgh, freight added to point of delivery.

Iron and Steel Bars

Steel bars at 2c. to 2.35c. from mill. Refined bar iron, 3.25c.

Welded Pipe

The following discounts are to jobbers for carload lots on the Pittsburgh basing card:

Butt Weld

Steel			Iron		
Inches	Black	Galv.	Inches	Black	Galv.
⅛, ¼ and ⅜	50½	24	⅛	15½ to 16½	+10½ to 11½
½	54½	40	¼	19½ to 20½	1½ to 2½
¾ to 3	57½	44	⅜ to 1½	24½ to 25½	8½ to 9½

Lap Weld

2	50½	38	2	20½ to 21	6½ to 7
2½ to 6	53½	41	2½ to 6	22½ to 23	9½ to 10
7 to 12	50½	37	7 to 12	19½ to 20	6½ to 7
13 and 14	41				
15	38½				

Butt Weld, extra strong, plain ends

⅛, ¼ and ⅜	46½	29	⅛	+16 to 17	+49 to 50
½	51½	39	⅜	13½ to 14½	+2½ to 3½
¾ to 1½	55½	43	½	18½ to 19½	5½ to 6½
2 to 3	56½	44	¾ to 1½	24½ to 25½	9½ to 10½

Lap Weld, extra strong, plain ends

2	48½	37	2	21½ to 22½	8½ to 9
2½ to 4	51½	40	2½ to 4	23½ to 24	11½ to 12
4½ to 6	50½	39	4½ to 6	22½ to 23	10½ to 11
7 to 8	46½	33	7 to 8	14½ to 15	2½ to 3
9 to 12	41½	28	9 to 12	9½ to 10	+2 to 2½

To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variations in weight of 5 per cent.

On butt and lap weld sizes of black iron pipe discounts for less than carload lots to jobbers have been seven (7) points lower (higher price) than carload lots and on butt and lap weld galvanized iron pipe have been nine (9) points lower (higher price).

Boiler Tubes

The following are the prices for carload lots f.o.b. Pittsburgh:

Lap Welded Steel		*Charcoal Iron*	
1¾ to 2 in.	19½	1⅜ to 1⅞ in.	+10
2¼ in.	24	2 in.	List
2½ to 3¼ in.	30½	2¼ in.	—2
3½ to 4½ in.	40½	2½ in.	—6
		2¾ to 3¼ in.	—7
		3½ to 4½ in.	—12

Standard Commercial Seamless—Cold Drawn or Hot Rolled

Per Net Ton		Per Net Ton	
1 in.	$327	1¾ in.	$207
1¼ in.	267	2 to 2½ in.	177
1⅜ in.	257	2¾ and 3¾ in.	167
1½ in.	207	4 in.	187
		4½ to 5 in.	207

These prices do not apply to special specifications for locomotive tubes nor to special specifications for tubes for the Navy Department which will be subject to special negotiations.

Sheets

Prices for mill shipments on sheets of standard gage in carloads, f.o.b. Pittsburgh, follow:

Blue Annealed

	Cents Per Lb.		Cents Per Lb.
No. 8 and heavier	3.15 to 3.45	Nos. 11 and 12	3.25 to 3.60
Nos. 9 and 10 (base)	3.20 to 3.55	Nos. 13 and 14	3.30 to 3.65
		Nos. 15 and 16	3.40 to 3.75

Box Annealed, One Pass Cold Rolled

	Cents Per Lb.		Cents Per Lb.
Nos. 17 to 21	3.90 to 4.15	No. 28 (base)	4.10 to 4.35
Nos. 22 to 24	3.95 to 4.20	No. 29	4.20 to 4.45
Nos. 25 and 26	4.00 to 4.25	No. 30	4.30 to 4.55
No. 27	4.05 to 4.30		

Galvanized Black Sheet Gage

	Cents Per Lb.		Cents Per Lb.
Nos. 10 and 11	4.50 to 4.70	Nos. 25 and 26	5.20 to 5.40
Nos. 12 to 14	4.60 to 4.80	No. 27	5.35 to 5.55
Nos. 15 and 16	4.75 to 4.95	No. 28 (base)	5.50 to 5.70
Nos. 17 to 21	4.90 to 5.15	No. 29	5.75 to 5.90
Nos. 22 to 24	5.05 to 5.25	No. 30	6.00 to 6.20

Tin-Mill Black Plate

	Cents Per Lb.		Cents Per Lb.
Nos. 15 and 16	4.00 to 4.15	No. 28 (base)	4.20 to 4.35
Nos. 17 to 21	4.05 to 4.20	No. 29	4.25 to 4.40
Nos. 22 to 24	4.10 to 4.25	No. 30	4.25 to 4.40
Nos. 25 to 27	4.15 to 4.30	Nos. 30½ and 31	4.30 to 4.45

Non-Ferrous Metals

The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York		Tin	Lead		Zinc	
Feb.	Lake	Electrolytic	New York	New York	St. Louis	New York	St. Louis
16.....	13.50	13.00	31.50	4.55	4.35	5.35	5.00
17.....	13.25	12.75	32.00	4.55	4.30	5.35	4.95
18.....	13.25	12.75	33.00	4.50	4.25	5.35	4.95
19.....	13.25	12.75	....	4.40	4.25	5.35	4.95
21.....	13.25	12.75	32.50	4.40	4.20	5.35	4.95

NEW YORK, Feb. 21.

There is almost no buying and the price tendency is downward. What little demand for copper there was has disappeared and the market is easier. Buying of tin is only moderate, but prices are fairly steady. In the absence of any demand lead is lower. The zinc market shows no improvement and prices have declined slightly.

New York

Copper.—The better feeling and slightly better demand which pervaded the market a week or two ago have disappeared. There is almost no buying reported from any source. As a consequence some sellers' ideas of prices have undergone a change and the market is lower, with electrolytic copper for spot and nearby delivery quoted at 12.75c. to 13c., with forward delivery at 13c. to 13.25c., depending upon the position. Lake copper is largely nominal at 13.25c. to 13.50c.

Tin.—The market for the greater part of the past week has been dull and featureless. Consumers in general are holding off. Dealers, however, were buyers on Feb. 16 of such cheap lots as could be obtained and several transactions were made of Straits tin for March shipment at 31.50c. and later on that day at 32c. The only interesting development is the feeling among importers that a duty on tin of 10c. a lb. is likely to become a law. The London market to-day is about £2 per ton under that of a week ago, with spot standard quoted at £170, future at £173 10s., and spot Straits at £190. Arrivals thus far this month have been 1690 tons, with 2070 tons reported afloat.

Lead.—The feature in this market has been the reduction by the American Smelting & Refining Co. of its price three times in the last week, or from 4.75c. to 4.60c., then to 4.50c., and finally to 4.40c. last Saturday, both New York and St. Louis. The market is devoid of demand. The outside market is quoted at 4.40c., New York, or 4.20c., St. Louis, for early delivery.

Zinc.—Demand is not any heavier and, for what little business has been offered, quotations have broken the 5c., St. Louis, level and are now 4.95c. for early delivery. Inquiries are confined to 100 tons or smaller lots, there being one to-day for 100 tons from a Middle Western consumer. The New York quotation for early delivery is 5.35c., which can easily be satisfied by imported metal at this level. Domestic metal for delivery, Eastern seaboard, is 5.45c.

Antimony.—Demand continues light but stocks are heavy. Business could easily be done at 5.20c., New York, which we quote as the market, duty paid, for wholesale lots for early delivery.

Aluminum.—The leading producer quotes 28c. per lb., producer's plant, for virgin metal, 98 to 99 per cent pure, for wholesale lots for early delivery, while other sellers are offering the same grade at 23.50c. to 24.50c., New York.

Ferroalloys.—Demand for ferromanganese is confined to a few carload lots, and while no sales are reported, it is evident that this demand can be satisfied at prices close to or under the level for which resale material has recently sold, or $92 to $95, delivered. The British quotation remains unchanged at $100, seaboard. The spiegeleisen market is inactive, with the higher grade quoted at $35 to $40, furnace, between which range most of the recent business was done. There is no demand for manganese ore, the quotation remaining nominal at 35c. to 40c. per unit, seaboard, for high grade ore. The 50 per cent ferrosilicon market is also inactive, with the quotation of most of the leading producers at $92 to $95, delivered. There is an active movement afoot to obtain a duty on this material.

Old Metals.—The market has been quiet this week with little business. Values generally are unchanged with the exception of lead which is lower. Dealers' selling prices are nominally as follows:

	Cents Per Lb.
Copper, heavy and crucible	12.75
Copper, heavy and wire	12.00
Copper, light and bottoms	10.25
Heavy machine composition	12.50
Brass, heavy	9.00
Brass, light	6.75
No. 1 red brass or composition turnings	10.00
No. 1 yellow rod brass turnings	6.75
Lead, heavy	4.00
Lead, tea	2.75
Zinc	3.25

Chicago

CHICAGO, Feb. 21.—The market is weaker in all the metals and copper, lead and antimony have declined. Some of the grades of old metals have also receded in price. It is felt that prices will show little material change until a resumption of industrial activity makes inroads into present surplus stocks. We quote Lake copper at 13.50c. in carload lots; tin, 36c.; lead, 4.45c.; spelter, 5.10c.; antimony, 7c. On old metal we quote copper wires, crucible shapes, 8.75c.; copper clips, 8.75c.; copper bottoms, 7.50c.; red brass, 9c.; yellow brass, 5.75c.; lead pipe, 2.75c.; zinc, 2.75c.; pewter, No. 1, 17c.; tinfoil, 20c.; block tin, 24c., all these being buying prices for less than carload lots.

St. Louis

Feb. 21.—In the non-ferrous markets there has been a continuance of the inactivity that has existed for some time. In car lots lead is quoted at 4.25c.; spelter at 4.95c. In less than car lots the figures are: Lead, 4.75c. to 5c.; spelter, 5.50c. to 6c.; tin, 38c.; copper, 14c.; antimony, 7.50c. In the Joplin district ores are weak, with zinc blende at $22.50 per ton basis of 60 per cent metal, and lead, $45 per ton basis of 80 per cent metal. No calamine is being sold and no prices established therefor. On miscellaneous scrap metals we quote dealers' buying prices as follows: Light brass, 4c.; heavy yellow brass, 6.50c.; heavy red brass, 10c.; heavy copper and copper wire, 10c.; light copper, 9c.; pewter, 18c.; tinfoil, 20c.; zinc, 3c.; lead, 3.50c.; tea lead, 2c.; aluminum, 10c.

Norton Co.'s Selling Policy

The Norton Co., Worcester, Mass., has adopted the new policy of selling direct to the trade, having closed its contracts with its dealers and established sales offices of its own. The company already had stores in Chicago, Detroit and New York for the distribution of the abrasive wheel end of its business, and machine division offices have been combined with these. In addition, offices have been established in Cleveland, Pittsburgh, Philadelphia, Indianapolis, Syracuse, N. Y., and Hartford, Conn., and the New England territory will be handled from the main offices at Worcester. The machinery agencies will be conducted by district managers, as follows: New York, Harry Harding; Chicago, Hiram N. Cudworth; Detroit, Oscar Knight; Cleveland, Oscar E. Nordstrom; Pittsburgh, Paul R. Hawkins; Philadelphia, Paul Hoffman, and New England, George C. Montague; and by district agents, Indianapolis, Walter Rogers; Syracuse, Walter Cook, and Hartford, Henry Peckham. Mr. Harding of the New York office has been the company's representative in Europe, and is brought back to fill the important post in the metropolis.

The managers of the several district offices of the Cutler-Hammer Mfg. Co., Milwaukee, Wis., were in attendance at a general sales meeting in Milwaukee during the week of Feb. 14 to 19, under the direction of W. C. Stevens, sales manager.

PERSONAL

O. L. Pringle, formerly assistant metallurgist of Midvale Steel & Ordnance Co., has succeeded Edward McGeehan as superintendent of steel works of the Pittsburgh Crucible Steel Works, Midland, Pa. Mr. Pringle will have charge of the open-hearth department and the blooming and billet mills. He was located for five years at the plant of Midvale Steel & Ordnance Co., Johnstown, Pa., and for the past year has been in Philadelphia with the company.

C. S. Vought, vice-president American Steel Export Co., 233 Broadway, New York, has resigned and will sail about the end of March for the Far East. Mr. Vought was for about three years the representative of the company in Europe.

Victor Greiff, E.E., who joined the American Bosch Magneto Corporation, Springfield, Mass., a year ago, to install and put into operation a research laboratory for the study and development of electrical automotive equipment, has completed the work and returned to his home in New York.

Robert P. Sanborn has been appointed manager of the traction department of the Edison Storage Battery Co., with headquarters at the factory and main office, Orange, N. J. Mr. Sanborn is well known to the industry through a connection of several years in the power and mining department of the General Electric Co., Erie Works, Erie, Pa.

President S. R. Fraim, E. T. Fraim Lock Co., Lancaster, Pa., announces that Alfred W. Clark, Stamford, Conn., has assumed the duties of general sales manager for that corporation, with offices at Lancaster. He became associated with the Yale & Towne Mfg. Co., March 1, 1890, as entry clerk. Later he became salesman, and after 11 years in that capacity he became successively manager of trade sales, assistant general manager of the Stamford plant, and general manager of the Canadian Yale & Towne plant. Five years ago he was made manager of price and product for the entire company.

William P. Stout has been appointed district manager of sales of the Columbia Steel & Shafting Co., Pittsburgh, at Boston, succeeding R. C. MacMillen, resigned. Mr. Stout was formerly district manager of sales at Philadelphia, and has been succeeded at that point by Joseph J. Conlisk, formerly assistant district manager of sales at the Cleveland office.

Richard R. Hicks has been made president and treasurer of the American Steam Pump Co., Battle Creek, Mich., succeeding Edward C. Hinman, former president and treasurer, who died Jan. 11. Mr. Hicks has been with the company 25 years.

George J. Blanton, who for the past four years has been with the engineering sales department, Chain Belt Co., Milwaukee, has been made New York district manager. Before joining this company in 1917 Mr. Blanton was associated with the General Electric Company for eight years. He is a graduate of the University of Michigan in mechanical and electrical engineering, class of 1909. He will leave immediately to take charge of the company's offices at 50 Church Street, New York.

The Fort Pitt Bridge Works of Pittsburgh, at a recent meeting of the board of directors, elected the following officers: President, Theodore A. Straub, formerly vice-president and general manager; vice-president and consulting engineer, H. R. Blickle, formerly secretary and chief engineer; secretary and treasurer, P. B. Straub, formerly treasurer.

J. C. Goode, who has acted as purchasing agent of the American Steel Export Co., 233 Broadway, New York, during the past year and who previously visited the Orient in the interests of the company, has resigned.

Roy M. Hood, who has been in charge of purchases at the Maxwell-Chalmers Corporation plant in Detroit, has resigned.

J. W. Wilford, for the last two years manager of the Michigan Crankshaft Co., Lansing, Mich., and Saginaw, Mich., units, has been called to Detroit by the General Motors Corporation to become general manager of the Central Forge Co. T. M. Carpenter, assistant manager of the Saginaw unit of the Michigan Crankshaft Co., will succeed Mr. Wilford.

G. Walter Sanborn, purchasing agent, William Tod Co., Youngstown, Ohio, prior to its absorption by the United Engineering & Foundry Co., Pittsburgh, and since that time assistant purchasing agent of the latter company, has been named purchasing agent, succeeding H. A. Grusch, who resigned recently.

Richard Garlick, treasurer, Youngstown Sheet & Tube Co., Youngstown, Ohio, was elected a director of the F. B. Stearns Co., Cleveland, automobile manufacturer, at the annual meeting, Feb. 17, in Cleveland, succeeding Paul Wick, of Youngstown, vice-president and secretary of the Falcon Steel Co., resigned. Philip Wick, Youngstown, vice-president Trumbull Steel Co., Warren, Ohio, was also named on the board of the Stearns company.

Carl A. Wendell, for the past few years chief engineer of the American Ore Reclamation Co., 71 Broadway, New York, and previous to that connected for several years with the United States Steel Corporation, has been retained by the General Briquetting Co. as consulting engineer, in connection with its flue dust and ore briquetting development. He will also specialize in coal washing and, as a natural adjunct thereto, in coal briquetting.

Edward W. Beach, general manager, Ferro Machine & Foundry Co., Cleveland, has been elected president of that company, succeeding Crispin Oglebay, who has been made chairman of the board of directors. Mr. Beach will continue as general manager. Mr. Oglebay has retired from the presidency in order to give more time to Oglebay, Norton & Co., in which firm he is interested.

A. K. Barker, Harrisburg, Pa., was elected president of the Harrisburg Pipe & Pipe Bending Co. at the annual meeting of the stockholders. Other officers elected include E. C. Smith, vice-president and general superintendent; E. C. Frey, general manager and treasurer; W. W. Cassel, secretary; D. E. Tracy, W. P. Starkey, William Jennings, A. K. Barker and E. C. Frey, directors.

J. P. Normoyle, formerly sales representative in Chicago for the Standard Oil Co. and latterly assistant manager of that company's station at Joliet, Ill., has been appointed assistant manager of sales in Chicago territory for the Williamsport Wire Rope Co., with headquarters at 122 South Michigan Avenue, Chicago.

Dr. George K. Burgess, Chief of the Division of Metallurgy of the United States Bureau of Standards, will address the Cleveland chapter of the American Society for Steel Treating at the rooms of the Cleveland Engineering Society, Feb. 25, on "The Metallurgical Work of the United States Bureau of Standards."

W. H. Underwood, associated with Domhoff & Joyce, pig iron brokers, for the past 10 years and manager of the Chcago branch during the last two years, has become associated with the St. Louis Coke & Chemical Co., in charge of sales, with offices at the Boatman Bank Building, St. Louis.

W. A. Porterfield, Dallas, Tex., who has been connected with the engineering department of the General Electric Co., has been appointed general sales manager of the Union Metal Mfg. Co., Canton, Ohio, succeeding C. L. Eshleman, who has resigned to devote his attention to personal affairs.

S. D. Inman has been placed in charge of the engineering and design of the American trolley carrier, monorail conveying equipment for handling coal, ashes, sand and gravel, of the Conveyors Corporation of America, formerly the American Steam Conveyor Corporation, Chicago and New York. Mr. Inman has been

associated with the Conveyors Corporation in an engineering capacity for over a year.

George H. Hull resigned as general manager of the Pennsylvania Shafting Co., Spring City, Pa., Feb. 8, to assume new duties as president of the Lehigh Engineering Co., Royersford, Pa. Mr. Hull will remain on the board of directors and act in an advisory capacity as secretary of the corporation.

William M. Thompson, formerly with the Reading Iron Co., has become Western sales manager of J. B. Wise, Inc., Watertown, N. Y., with headquarters at 1116 Lytton Building, Chicago.

American Engineering Council Elects Secretary

At the meeting of the executive board in Syracuse, N. Y., Feb. 14, Lawrence Wilkerson Wallace was elected secretary of the American Engineering Council, to succeed L. P. Alford, New York, who has been acting secretary since the formation of the council at Washington last November. Mr. Wallace, who has been one of the most active figures in the council, has been its treasurer since organization. As vice-chairman of the council he has directed the work of the committee on elimination of waste in industry, the personnel of which was given in last week's issue.

L. W. WALLACE

Mr. Wallace was born in Austin, Tex., in 1881 and is a graduate of the Agricultural and Mechanical College of Texas, having also received a degree from Purdue University. After leaving college he served with the Santa Fe Railroad until 1906 and then entered the Purdue faculty. During this period he conducted researches and did consulting work in railroad mechanical engineering and factory management. He was afterward in charge of production with the Diamond Chain & Mfg. Co., Indianapolis. He is the author of technical works.

Mr. Wallace, who is a member of the American Society of Mechanical Engineers, is now serving his third term as president of the Society of Industrial Engineers and is a past president of the Indiana Engineering Society, besides being a member of a number of other associations and clubs. He is preparing to transfer his activities from the temporary headquarters of the council at 29 West Thirty-ninth Street, New York, to the permanent national headquarters in the McLachlen Building, Washington.

New Company to Make Ferrozirconium

The Industrial Bureau, Board of Trade, Baltimore, Md., has announced that the Zirconium Co. of America has acquired the plant of the Baltimore Rubber Tire Mfg. Co., Monument and Eleventh streets, Baltimore, and will manufacture ferrozirconium, and zirconium oxide. The property acquired consists of six buildings. The officers of the company are George F. Dixson, president; Philip C. Spencer, vice-president; Charles W. Smiley, secretary, and Morris Meyer, treasurer.

German Competition in Coal

UNIONTOWN, PA., Feb. 21.—First indications of stiff German competition for South American coal and coke tonnage developed last week in inquiries received for a 2000 to 5000 ton coke contract for transportation to Chile. Local brokers quoted $4.50 to $5 to their New York representatives and were notified that German bidders had underbid for the contract.

OBITUARY

DONALD K. FRASER, son of Donald Fraser, Sr., second vice-president, Sivyer Steel Casting Co., Milwaukee, died Feb. 11 at Toronto, Can., following an illness of a year from heart trouble. Mr. Fraser was traveling for the benefit of his health. He was 43 years of age. He formerly was associated with his father in the Sivyer company. After serving in the world war he became connected with steel foundries in Racine, Wis., but ill health made it necessary for him to relinquish active work.

JOHN WILCOX PRATT, vice-president and secretary, Wiard Plow Co., Batavia, N. Y., died suddenly Feb. 3 at the Holland Club, that city. He was born April 25, 1859.

JACOB GOTTFRIED BRAUN, for more than 30 years a manufacturer and an importer of iron and steel in Chicago, died at his residence in that city on Feb. 12. Mr. Braun went to Chicago in 1888, establishing an iron picket fence plant on Ogden Avenue, near Polk Street. In 1896 he moved his plant to Paulina and Harrison streets, which he operated until his death. Since 1893 he had been a large importer of ornamental iron, steel moldings and machinery.

MICHAEL J. BOLTEN, Newark, N. J., president and treasurer, Couse & Bolten, Inc., that city, manufacturer of mechanical belting, died at his residence, 824 South Twelfth Street, Feb. 11. He was born in Bridgeport, Conn., 47 years ago, and moved to Newark when a young man. He started the local business about 25 years ago. Mr. Bolten had been ill for a year.

HENRY C. SEIDEL, president, R. B. Seidel, Inc., Philadelphia Black Lead Crucible Works, the past 20 years, died on Feb. 12 at his home, Gibraltar, Pa., aged 70 years.

Talk of Canadian Merger Revived

TORONTO, ONT., Feb. 21.—A further step in the direction of bringing to a conclusion the long delayed merger of steel and other interests under the name of British Empire Steel Corporation is expected to be taken at a meeting to be held in Montreal, Que., of the directors of the Nova Scotia Steel & Coal Co., and there is a possibility that the plans may be made known before the close of the present month. It is understood that the plans as modified will be submitted to the full board after having been under consideration by the executive for some time. It is now approaching a month since Roy Wolvin, president of the Dominion Steel Corporation, and D. H. McDougall, president of the Nova Scotia Steel & Coal Co., returned from London, where they had a conference with the British interests in the proposed new corporation. It was slightly over two weeks later that the Dominion Steel Corporation met to consider the proposal, but no official intimation has been made as to progress and the fact that the Nova Scotia board is only getting together now is indicative of the necessity of making progress with the deal. In a general way it is understood in the street that the merger proposals have narrowed down to three companies in place of the four mentioned some time ago. The only change is the dropping of the Maritime Nail Works, Ltd., St. John, N. B., of which Stanley E. Elkins is president. This company is a relatively small one, and its omission will not affect the main plan. This brings the merger down to the Dominion Steel Corporation, the Nova Scotia Steel & Coal Co. and the Halifax Shipyards, Ltd.

The American Defense Society has engaged to secure money from manufacturers to help combat the propaganda of radicalism. One of its means is of course the provision of pay envelope inserts. Manufacturers are asked to make payments to Benjamin L. Allen, treasurer, 116 East Twenty-fourth Street, New York. E. H. Hooker, president Hooker Electrochemical Co., New York, has been elected chairman of the board of trustees of the society.

Machinery Markets and News of the Works

SANTA FE PURCHASES

Recent Promising Inquiries Have Been Postponed or Withdrawn

Used Tool Business Better Than That of New—Fair Foreign Inquiries and Sales

The Santa Fe Railroad bought $100,000 worth of machine tools for its shops at Albuquerque, N. Mex., the inquiry having developed much competition and some price cutting. Many inquiries placed toward the close of last year and expected to result in sales this year have either been postponed or withdrawn, one of these being the National Lamp Works, which has postponed buying until July.

In most centers the used tool business is more active than that of new. An auction of machinery of three New England plants failed to draw out more than half a dozen manufacturers and prices bid were very low.

There are a few inquiries and sales for export. The Japanese Navy purchased 20 milling machines, and it is reported that a Cincinnati lathe manufacturer secured an order for six machines for Java. Inquiries have been received from India and Russia, though it is expected that German makers will secure most of the business from the latter nation.

The Sidney Machine Tool Co., Sidney, Ohio, has made a 20 per cent reduction on engine lathes. Although there have been several cases of reductions the past few weeks, the great majority of standard makes have suffered no price changes. One central Ohio builder who made a price cut has now reduced wages 25 per cent.

The Board of Education, Joliet, Ill., bought $10,000 worth, including engine lathes and miscellaneous small tools.

New York

NEW YORK, Feb. 21.

A few foreign inquiries for machine tools are in the market, but domestic inquiry and sales continue extremely light. Most of the foreign inquiries emanate from Japan, and some have already resulted in business. The Japanese navy has been an active buyer and one recent purchase was for 20 milling machines. There have been inquiries also from India and Russia. The machine-tool trade has expected that at some time Russia would become a fairly large buyer of tools, but whether the current inquiries are the forerunners of such a buying movement is considered doubtful. At any rate, the expectation is that Germany will take a large proportion of whatever Russian business may eventually develop.

Readjustment of machine-tool prices to a lower basis continues slowly, but the fact remains that a large majority of the standard tools have not been reduced. The Sidney Machine Tool Co., Sidney, Ohio, has made a reduction of 20 per cent in the prices of its engine lathes.

Demand for used tools is somewhat improved and a fair business is being done by a few local dealers.

There is slight change in the crane market. Inquiries are still pending for various reasons. The M. W. Kellogg Co., Jersey City, N. J., has reissued its inquiry for a list of cranes with several revisions. A 10-ton auxiliary has been added to the 40-ton overhead crane in building No. 5 and two 20-ton, 70-ft. span cranes have been substituted for the one 20-ton, 61-ft. 11½-in. span crane in building No. 4. An additional 20-ton, 36-ft. 6-in. span crane is also in the revised inquiry. The Empire State Steel Corporation, 233 Broadway, New York, is in the market for a new or second hand 10-ton or 15-ton locomotive crane equipped with generator and magnet for scrap handling. The Turner Construction Co., 242 Madison Avenue, New York, is inquiring for a small hand power crane for the West India Oil Refining Co., Havana, Cuba.

The Standard Shipbuilding Co., Shooters Island, N. Y., has sold a 15-ton and 20-ton Ohio, and a 15-ton American Hoist & Derrick Co. locomotives cranes to Philip T. King, 30 Church Street, New York.

The Telescope Cot Bed Co., 535 East Seventy-ninth Street, New York, manufacturer of metallic bedsteads, will take bids early in April for its proposed plant at Granville, N. Y., to be one story, 70 x 420 ft., with power house, and estimated to cost about $100,000. Russell G. Cory, 50 Church Street, is architect and engineer.

W. N. Best, 11 Broadway, New York, has incorporated the W. N. Best Furnace & Burner Corporation with capital of $1,000,000 to manufacture furnaces, oil burners, tar burners, etc. Other incorporators are S. J. Sykes and W. H. Gillon.

The Waters Arc Welding Corporation, New York, has been incorporated with a capital of $100,000 by H. A. Miller, F. C. Lord and A. K. George, 166 West Seventy-seventh Street, to manufacture welding apparatus.

The Superior Fireproof Door & Sash Co., 1131 Carter Avenue, New York, is having plans prepared for a one-story addition, 63 x 140 ft., to cost about $15,000.

The Seabring Copper Works, Inc., Brooklyn, has been incorporated with a capital of $25,000 by J. D. Maxwell, R. J. Fleissner and F. V. Smith, 97 Clark Street, to manufacture copper and bronze products.

The Master Phone Corporation of America, New York, has been incorporated with a capital of $150,000 by F. C. White, H. Rein and A. M. Hann, 431 East 136th Street, to manufacture talking machinery and parts.

The A. C. Chesley Co., 277 Rider Avenue, New York, manufacturer of hollow metal fireproof doors, metal-covered doors, etc., has awarded a contract to H. S. Roberts, 151 East Thirty-eighth Street, for the erection of the superstructure of its proposed new plant, 50 x 200 ft. on 132nd Street, to cost about $100,000 with equipment.

The White Fuel Engineering Co., 742 East Twelfth Street, New York, has filed plans for a new two-story brick foundry, 100 x 103 ft., adjoining its plant, to cost about $75,000 with equipment.

C. A. Fox and B. M. Cobe, 711 West 180th Street, New York, have organized the Fox-Cobe Mfg. Co., to manufacture heating devices and kindred equipment.

The Keystone Tire & Rubber Co., 1877 Broadway, New York, will expend about $100,000 in building and equipping its new factory, 100 x 103 ft., on 192nd Street, plans for which are being prepared by Frank Sutton, 140 Cedar Street, engineer.

The Holbrook Co., West End Avenue and Sixty-seventh Street, New York, manufacturer of automobile bodies, has plans under way for a new one-story plant at Hudson, N. Y., 100 x 260 ft. John Graham is president.

The Tebo Yacht Basin Co., Brooklyn, operating a shipyard at the foot of Twenty-fourth Street, has received a contract from the United States Shipping Board for repairs to the vessel Archer, to include the installation of a new electric drive with other equipment, estimated to cost $83,300.

L. N. Larson, 4814 New Utrecht Avenue, Brooklyn, and associates have organized the Acme Rim Mfg. Co., to manufacture metal rims for automobile service.

The New York Engine Co., Watertown, N. Y., has placed its local plant on the market, comprising several buildings with large brass foundry, the whole totaling about 128,000 sq. ft. of space. The site aggregates 18 acres.

H. G. Harris, 716 West 180th Street, New York, and associates have organized the Great Eastern Iron Works, to manufacture iron and steel products.

The Giles Engineering Co., Grand Central Palace, New York, has plans under way for a new four-story metal-working plant at Flushing, L. I., 60 x 135 ft.

Coal handling and conveying machinery will be installed at the new reinforced-concrete coal pocket, 52 x 120 ft., to be constructed by the Putnam Coal & Ice Co., Herkimer Street and Buffalo avenue, Brooklyn, on Decatur Street, near Myrtle Avenue, to cost about $80,000.

Charles E. Fitchen, 262 West Thirty-first Street, New York, and associates have organized the Charles E. Fitchen Co., to manufacture automobile hardware and other metal goods.

The Butler Mfg. Co., Brewster, N. Y., has acquired the local plant of the Borden's Condensed Milk Co., comprising a number of buildings on a 15-acre site. The new owner will remodel the works for the manufacture of fuel-saving devices for automobiles and other service.

William P. and George Weber, 351 Sixth Avenue, Newark, N. J., have organized the Weber Auto Accessory Co., to manufacture automobile equipment and parts.

The Ware-Campbell Co., Hammonton, N. J., has been incorporated with a capital of $50,000 by Charles M. and Ernest D. Ware and Albert Campbell, to manufacture talking machine parts, motors, etc.

The Electro Service Co., West Hoboken, N. J., has been organized by Albert J. Casper, 413 Jane Street, and associates, to manufacture electrical goods.

The Astoria Light, Heat & Power Co., 130 East Fifteenth Street, New York, will build a one-story addition to its plant on Winthrop Avenue, Long Island City, 47 x 275 ft., to cost about $80,000.

Robert Grant, Woolworth Building, New York, iron and steel merchant, a large stockholder in the Slatington Iron & Steel Co., with plant at Slatington, Pa., has acquired the interests of other stockholders and will make additions and improvements to the works, to include the installation of new furnaces, cranes, etc.

Coal handling and conveying machinery will be installed at the new reinforced-concrete coal pocket to be constructed by Sinram Brothers, 910 East Fifth Street, New York, on property on the East River, near Thirty-seventh Street, recently acquired. Plans for the work are under way.

C. Kessel, 150 Nassau Street, New York; G. B. Muller and associates have organized the Peabody Brass Works, to manufacture brass and bronze castings and other metal products.

The General Ceramics Co., 50 Church Street, New York, will take bids early in April for an addition to its plant at Metuchen, N. J., to manufacture sanitary ware. It will be one and two stories, 165 x 785 ft., and is estimated to cost about $400,000 with machinery. Dietrich Wortmann, 116 Lexington Avenue, New York, is the architect.

The plant of the Unexcelled Mfg. Co., Jersey City, N. J., heretofore devoted to the manufacture of signal lights, etc., has been placed on the market. It consists of several one-story brick buildings on a 14-acre tract.

The Cohoes Power & Light Corporation, Cohoes, N. Y., has arranged for a bond issue of $725,000, the proceeds to be used in part for extensions in power plant and system.

New England

BOSTON, Feb. 21.

Machine tool sales the past week were few and far between. Inquiries also show a falling off and those which looked promising earlier in the month have not yet developed into orders. The used tool market is far more active than the new, yet even here a falling off in sales is noted, although prices are shaded whenever it is necessary to close a good deal. Buying of used machinery seldom exceeds two lots on one order and is usually for a special tool.

J. E. Conant & Co., Lowell, Mass., last Thursday sold at auction the equipment at the plants of the Vulcan Co., Springfield; the Marlboro Metal Works, Marlboro, and the Austin Mfg. Co., Waltham, Mass., the first two establishments having started during the war, and the Waltham in 1916. Lack of interest in machine tools was illustrated in the fact that less than a half dozen manufacturing companies were represented at this sale, and three that might be classified as such really are fabricators. Several dealers were on hand and while good prices were obtained for a few individual tools the bulk of the offerings went for comparatively low prices.

The Lowther Machinery Co., Boston, dealer, purchased four Cleveland Model B automatic screw machines at $212.50 each and four of the same model at $150 each, while the Standard Machinery Co., New Haven, Conn., dealer, took four at $200 each. The Lynd-Farquhar Co., Boston, bought a 10 x 36-in. Norton cylindrical grinder for $375, while the Lowther Machinery Co. bought a similar tool for $387.50, and another dealer a 6 x 32-in. Norton cylindrical grinder at the same figure, the price in each instance being low. A No. 6 Diamond double disk grinder brought $90, and a Pattison Victor No. 3 double bench grinder, $27.50, while a No. 4 Blount double floor grinder sold for $35. A No. 1 Le Blond universal cutter and tool grinder was bought for $187.50. A Marlboro automatic screw machine products grinder, new six months ago, with a capacity of 20,000 pieces per day, was purchased for $100.

Hill, Clark & Co., Boston, bought several drills, including four Champion 20-in. uprights at $87.50 each, a Cincinnati 24-in. upright at $187.50, and a Prentice 24-in. at $150. Another dealer took a 22-in. Hoefer upright drill at $160. The Standard Machinery Co. bid in two Charles G. Allen Co. high speed, two-spindle sensitive drills at $90 each. A 20-in. Snyder upright went for $70 and a Johnson 12-in. sensitive, with a saw table, $75, while a Canedy-Otto No. 16 motor-driven, post drill brought $150, and a Champion No. 201 direct motor drive drill post, $75.

The buying of lathes was erratic. One dealer paid $200 for a 15½-in. x 6-ft. South Bend lathe and a Marlboro electrical appliance manufacturer paid $387.50 for a Worcester 15-in. x 6-ft. tool makers screw cutting engine lathe. Another dealer paid $150 for a 16-in. x 6-ft. Blaisdell screw cutting engine lathe and the same price for a 16in. x 7-ft. machine. Dealers also took a 15-in. x 6-ft. Blaisdell hollow spindle screw cutting engine lathe at $55, a 14-in. x 6-ft. hollow spindle Pratt & Whitney at the same price and a 16-in. x 7-ft. Reed extra heavy lathe at $80.

A Waterville, Me., dealer bought a No. 3½ Greenerd bench arbor press for $27.50. The best press offered brought $175 and was a No. 1 V & O adjustable open back, power standard in good condition. The A. L. Smith Iron Works, Chelsea, Mass., bid in a No. 2 Kwink-Kut power hack saw, made by E. C. Atkins & Co., at $25, while a No. 2 Marvel, with a hand operated angle and timber tie bender and an anchor and timber bender thrown in, sold for $45.

The highest price paid for any one tool was $1275 by the Standard Machinery Co. for a No. 2 Rockford universal. A dealer bought a No. 25 Bilton milling machine for $338.50, and the Somerville Mfg. Co., Somerville, Conn., textiles, an almost new 18-in. Cincinnati automatic duplex milling machine for $325. Two No. 1 Van Norman hand millers sold at $55 each, and a Brown & Sharpe plain and an old type Stevens duplex, combined, at $55.

Other machines sold and their prices included a Lapointe double No. 2 automatic broaching machine, $175; Whiton two-spindle centering machine, $50; No. ¾ D Geometric threading machine, $125; New York Steam Engine Works 15 x 12-in. iron planer, $80; No. O Foster hand screw machine, $125; 16-in. Hendey geared shaper, $337.50; No. 2 Smurr & Kamen wire crimper, $475; Niagara sheet iron cutter, with capacity for cutting material up to 16-in. wide and ⅛-in. thick, $100; No. 2 Clark combination punch and shear, with a 1½-in. stroke, $450; No. 2 Merriman semi-automatic threading machine, $137.50; Niagara squaring shear, capable of cutting material up to and including 36-in. wide, $87.50; and a 30-in. Niagara bench brake, $50. The sale was slow and lacked animated bidding.

A manufacturer of a line of wood-working machinery has reduced prices 15 per cent, effective Feb. 15.

The Hager-Mann Mfg. Co., Boston, capitalized for $500,000, has taken out a Massachusetts charter to manufacture mechanical devices. Franklin D. Hager, 101 Tremont Street, Boston, room 904, is president, and Orrin W. Mann, 11 Vancover Street, treasurer.

The James H. Tower Co., Providence, R. I., fabricator, is building a one and one-half story addition, 80 x 120 ft., to its Allens Avenue plant, which when completed will practically double the capacity. Electric hoists probably will be installed.

Willis R. Smith, Auburn, Mass., is president and William E. Gifford, 3 Blue Hill Road, Worcester, treasurer of the Viking Specialty Co., Worcester, recently granted a Massachusetts charter to make socket wrenches. It is capitalized for $10,000, divided into 100 shares, par $100, 80 of which are issued.

The Stenman Electric Valve Grinder Co., Inc., 42 Southbridge Street, Worcester, Mass., plans to take additional space on the second floor of the Stevens Building which it will equip for the production of a new combination electric drill and valve grinder. Howard P. Gleason is president, and A. G. Sandbery, treasurer.

Plans are being drawn for a five-story, 60 x 120 ft. canning plant to be erected by the William Underwood Co., Boston, at Portland, Me. It is considering the manufacture of cans, in which case presses, etc., will be needed. The company also makes its own dies, etc., maintaining a machine shop at its Boston plant, which will be moved to Portland and enlarged.

The Woburn Brass & Iron Foundry, Woburn, capitalized for $50,000, has been granted a Massachusetts charter. Dan-

fel P. O'Brien, Thomas H. Marriman and George H. Foley, all of Woburn, are interested in the company.

The Edison Electric Illuminating Co., Brockton, Mass., will issue $516,000 additional capital to provide funds for plant expansion, etc.

Botwinik Brothers, 21 Sylvan Street, New Haven Conn., has acquired the plant of the Celluloid Starch Co., 138-50 Winchester Avenue. A portion of the factory will be equipped for machinery manufacture and the remainder, for the present, used for storage.

The Walker Silent Typewriter Co., Bridgeport, Conn., has been incorporated with a capital of $500,000 by A. C. and C. W. Walker, Jr., Bridgeport; and Leroy Hover, Stratford, Conn., to manufacture typewriters and parts.

The Standard Brass & Copper Tube Co., New London, Conn., has placed its plant on the market, comprising a new one-story, brick and steel building, totaling about 53,000 sq. ft. of floor space, on 2½ acres of land.

The United Wire Co., 806 Eddy Street, Providence, R. I., has filed notice of organization to manufacture wire products. Harry A. Beane, 14 Bogman Street, heads the company.

The Clark Rubber Co., Franklin, Mass., has been incorporated with a capital of $100,00 by Maurice A. Clark and Herbert A. Metcalfe, Franklin; and Leon B. Conant, Cambridge, Mass., to manufacture rubber products.

George E. Parker, Jr., 6 Fordham Court, Forest Hills, Boston, and associates, have organized the New England Oilless Bearings Co., to manufacture ball and roller bearings, etc.

The Vacucrete Co., Augusta, Me., has been incorporated with a capital of $100,000 by E. M. Leavitt, and Ernest L. McLean, Augusta, to manufacture machinery and tools.

M. C. Sullivan, 53 State Street, Boston, and associates, have organized the Four Wheel Hydraulic Brake Co., to manufacture hydraulic-operated brakes and other machinery.

The Whitin Machine Works, Whitinsville, Mass., is having plans prepared for a new three-story, brick and reinforced-concrete building, to cost about $150,000.

Philadelphia

PHILADELPHIA, Feb. 21.

The Alfred Box Co., 813 North Front Street, Philadelphia, manufacturer of hoisting machinery, cranes, etc., has taken bids for a new two-story shop, 28 x 85 ft., and 34 x 60 ft., at Ontaria and Janney streets.

Jacob R. Keiser, 416 South Broad Street, Philadelphia, and associates, have organized the Sheet Metal Products Co., to manufacture metal specialties. It will operate a plant at Shamokin, Pa.

The Morris Truck & Wheel Co., Seventy-fifth Street and Island Road, Philadelphia, has plans under way for a new one-story, brick and steel shop at Forty-second Street and Woodland Avenue. Clark & Dudnick, Drexel Building, are architects.

The Philadelphia Mechanical & Electrical School, 614 Brown Street, Philadelphia, has leased two floors in the building at Broad and Spring Garden streets, for general shop work and practical instruction.

The Steel Fittings Co., 2619 Christian Street, Philadelphia, is arranging for an addition to its plant on an adjoining site.

The Hardware Specialty Co., 1107 Locust Street, Philadelphia, manufacturer of hardware products, has leased the building at Randolph and South streets for new local works.

The Petersen Motors Co., Philadelphia, has leased a floor in the building at 1342-46 Brown Street, for the establishment of a new machine and repair works. The Schumacher & Pierce Co. has leased space in the same building for a similar shop, with department for parts production, painting, etc. Each floor comprises about 4000 sq. ft. of space.

Freight handling and conveying machinery, hoisting equipment, etc., will be installed by the Department of Wharves, Docks and Ferries, Philadelphia, in connection with the construction of new piers, extensions and bulkheads on the Delaware and Schuylkill rivers. A measure is before the Legislature at Harrisburg, appropriating $1,000,000 for the work. George Sproule is director of the department.

The Concete Specialties Co., Camden, N. J., recently organized with a capital of $200,000 to manufacture metal reinforced-concrete products, has awarded a contract to Shafer, Pierson & Co., Pitman, N. J., for its new one-story plant at Mt. Ephraim Avenue and Collins Road. LeRoy A. Goodwin, Brown and Chambers streets, Gloucester, N. J., is head of the company.

Ralph W. Woodruff, Selinsgrove, Pa., and associates, have organized the Monarch Mfg. Co., to establish a plant for the manufacture of machinery and parts.

Fire, Feb. 12, destroyed the tool works and electrical transformer building of the Delta Lighting & Power Co., with loss reported at about $12,000.

The E. T. Fraim Lock Co., Lancaster, Pa., advises that it has not purchased the plant and business of the Slaymaker Lock Mfg. Co., as stated in these columns last week, and is in no way connected with the Slaymaker company.

Chicago

CHICAGO, Feb. 21.

The Santa Fe Railroad has purchased $100,000 worth of machine tools for its Albuquerque, N. Mex. shops. This list engendered keen competition and sharp price cutting which somewhat delayed the closing of the order. In its main features the market is unchanged. Inquiries and orders for single machines are still the rule, although occasionally a moderate-sized purchase is made. The Board of Education of Joliet, Ill., has bought about $10,000 worth of equipment, including four engine lathes and miscellaneous small tools. The Western Clock Co., La Salle, Ill., has made a $6,000 purchase, including an engine lathe and a shaper. No further price reductions have been announced.

The Eclipse Lawn Mower Co., Prophetstown, Ill., has opened a new foundry which will employ 40 molders when working at full capacity.

The T. E. Tolleson Foundry Co., Loomis & Buchanan Streets, Rockford, Ill., will manufacture brass, bronze and aluminum castings, in addition to the iron castings in which it has specialized in the past. W. A. Stephens is manager.

The LaPorte Tractor & Foundry Co., LaPorte, Ind., has completed its plant at East Linco'nway and the Lake Erie & Western Railroad and will commence operations on or before April 1. The structure is 100 x 200 ft. The plant is not connected with the parent plant in Benton Harbor, Mich., although the same men who started the latter factory organized the LaPorte company.

G. Austin, Mankato, Minn., plans to convert a two story building on Second Street, near Hickery Street, into a garage to cost $45,000.

C. A. Trauger's machine shop, West Park Avenue, Spencer, Iowa, was destroyed by fire recently with a loss of about $2,000 worth of equipment.

The Chicago Blow Pipe Co., 216 North Sacramento Avenue, Chicago, is taking bids through Z. Erol Smith, 305 East Fifty-fifth Street, on a one-story plant, 73 x 76 ft., Clarkson Street, near West Lake Street, to cost $25,000.

The J. Lanski & Son Scrap Iron Co., 2117 South Jefferson Street, Chicago, has let contracts for a two-story plant, 90 x 98 ft., 3441-47 South Lawndale Avenue, to cost $40,000.

Wolf, Sayer & Heller, 900 Fulton Street, Chicago, manufacturers of packers' machinery, etc., are having plans prepared for a new four-story and basement factory, 100 x 125 ft., at Fifteenth and Paulina streets, to cost about $200,000 with equipment. Present buildings on the site will be razed at an early date. Paul Hansen, 820 Lawrence Avenue, is architect.

The Safety Zipper Mfg. Co., Clinton, Ill., has been incorporated with a capital of $150,000 by Grant E. Pollick, A. D. Barnes and L. F. Barnett, to manufacture metal products.

The American Elevator & Conveyor Co., 1355 West Fifty-ninth Street, Chicago, has been incorporated with a capital of $25,000 by Arthur A. G. Land, Adolph H. Sterly, and Albert S. Hoffman, to manufacture elevating and conveying machinery.

The Cedar Rapids Tire & Rubber Co., Mu'in Building, Cedar Rapids, Iowa, will defer the erection of the superstructure of its new tire and rubber manufacturing plant at Twenty-second Avenue and A Street, until spring. The foundation work has been completed. The factory will be two-stories, 128 x 308 ft., and is estimated to cost $300,000 with machinery. F. J. Foote is head.

The Romon Chassis Lubricator Co., 76 West Monroe Street, Chicago, has been incorporated with a capital of $50,000 by W. W. Lehr, F. M. Hartman and D. S. Bobb, to manufacture lubricating devices and equipment for motor cars.

The Cote Brothers Mfg. Corporation, Chicago, has been incorporated with a capital of $60,000 by Thomas F. Cote, Hubert N. Stronck and Elmer H. Greaves, 4670 West End Avenue, to manufacture machinery and electrical devices.

The Western Body Mfg. Co., 763 Third Street, North, Minneapolis, Minn., manufacturer of automobile bodies, is having plans prepared for a new three-story and basement

factory. Bell & Kinsport, Hawkes Building, are architects.

The Collapsible Rim Mfg. Co., Omaha, Neb., has been incorporated with a capital of $2,000,000 by Love Culbreth and B. F. Eaglin, Omaha; and E. F. O'Brien, Lexington, Neb., to manufacture metal rims for automobile wheels.

The American Insulated Wire & Cable Co., 954 West Twenty-first Street, Chicago, has engaged D. S. Klafter, architect, 64 West Randolph Street, to prepare plans for additions and improvements in its works on Twenty-second Street, to cost about $300,000. Nathan T. Brenner is president.

Buffalo

BUFFALO, Feb. 21.

The Commercial Machine Co., 35 West Front Street, Dunkirk, N. Y., is completing plans for a new one-story factory, 48 x 155 ft., to cost about $25,000. A. J. Gardiner is president and secretary.

The Roll Brothers Mfg. Co., Depew, N. Y., has been incorporated with a capital of $100,000 by W., L., and R. Roll, Depew, to manufacture light machinery and metal specialties.

The Griener-Semon-Lowry Co., Everson Building, Syracuse, N. Y., manufacturer of machinery and tools, has completed plans for a new one-story machine shop on West Taylor Street, 40 x 125 ft., to cost about $100,000. Of this amount, approximately $75,000 will be expended for machine tools and other equipment. G. A. Greiner is president.

Fire, Feb. 12, destroyed the plant of the National Sign Co., Canisteo, N. Y., manufacturer of metal signs, etc., with loss estimated at about $50,000. The company recently removed from Dayton, Ohio.

The plant of the United States Horse Shoe Co., Erie, Pa., has been acquired by the Wayne Steel Co., Erie, for $1,021,000. The new owner will occupy the plant for the manufacture of steel and iron products.

The Manlius Engineering Co., Manlius, N. Y., manufacturer of mechanical specialties, has been reorganized with an active capital of $50,500, with preferred stock to the value of $50,000.

Cincinnati

CINCINNATI, Feb. 21.

It is quite generally admitted that lower machine tool prices will have to come before there will be a revival in the industry and a few local manufacturers are understood to be contemplating a move in this direction. It is pointed out, however, that present manufacturing costs do not justify such a step, but that a revision of prices might tend to restore the confidence of buyers to such an extent that they will come into the market for their needs. In connection with a recent cut by a central Ohio builder, a 25 per cent cut in wages has since been put into effect, and the manufacturer is now in a position to manufacture for stock without fear of being caught with machines built at peak prices.

There is very little local business being placed. Salesmen covering this section, report, however, that a gradual resumption of manufacturing in metal lines is in progress, and that while this has not yet affected the machine tool industry to any extent, the prospects are good. A feature of the week was an order by a lathe manufacturer for export to Java, said to be for six machines. An elevator manufacturer who had been negotiating for about $50,000 worth of tools, has withdrawn the inquiry for the present. The Laminated Metal Products Co., a local company in process of formation, is expected to complete the purchase of a substantial list of equipment this week.

A fair demand for used tools is still in evidence. In this connection it is stated that an Eastern dealer has recently advised that he will reduce prices on all used tools approximately 25 per cent.

The Laminated Metal Products Co., Cincinnati, will apply for incorporation papers this week with a capitalization of $500,000. It will manufacture safe deposit boxes, home safes and metal stampings and has obtained a factory on Dana Avenue, Norwood, containing 20,000 ft. of floor space. Everett C. Kline, with the Victor Safe & Lock Division of the Marietta Safe Cabinet Co., is to be the principal official of the new company. Equipment will be purchased this week, and operations will be commenced within the next 60 days.

The Dayton Aluminum & Mfg. Co., Dayton, Ohio, recently organized for the manufacture of aluminum ware, will locate at 413 West Fifth Street, having taken over two buildings which will be remodeled.

The company taking over the plant of the Platt Iron Works, Dayton, Ohio, will be known as the Platt Iron Works, Inc. The new owners contemplate some improvements to the plant, but not immediately, and will continue the manufacture of pumps and parts for the present. Edward C. Wells is vice-president and general manager.

Plans will be posted this week and bids taken for a one-story factory for the C. L. Greene Co., spring manufacturer, Cincinnati. It will be of steel and brick in the form of an E, the main building, 60 ft. x 285 ft. Samuel Hannaford & Sons are the architects.

The Highway Motors Co., Defiance, Ohio, has preliminary plans under way for a new three-story, brick and steel factory for the manufacture of automobile motors and parts, to cost about $200,000 with machinery.

The Dayton Malleable Iron Co., West Third Street, Dayton, Ohio, is planning for the erection of a two-story shop, 80 x 160 ft., on Third Street, to cost about $30,000, to replace a structure recently destroyed by fire.

The Franklin Tractor Co., Greenville, Ohio, manufacturer of motor tractors, is considering the erection of a two-story, brick and steel addition, 50 x 120 ft., to cost about $50,000.

Pittsburgh

PITTSBURGH, Feb. 21.

The machine tool business remains at an extremely low ebb in this district. Demand is governed to a large degree by conditions prevailing in the iron and steel industry and there is an even greater hesitancy at present to buy equipment than at any time since last fall. In view of the numerous reductions which have been made by machine tool builders since the first of the year, the lack of buying is not entirely due to the prices now asked. There are a great many requirements to be covered, but some users apparently are none too well off financially and do not regard this as a time to make purchases. A potent factor in the lack of buying is the straightened circumstances of the railroads. A few inquiries have come out in the past week for prices of cranes but there has been nothing in the way of important sales.

The H. D. Shawkey Motor Co., 5925 Baum Boulevard, Pittsburgh, has completed plans for a new two-story service and machine repair building, 80 x 100 ft., Penn Avenue and Stratford Street, to cost about $100,000.

The Sanitary Refuse Destructor Co., Pittsburgh, is being organized by P. S. Kier, O. C. Lobert and P. W. Matthews, to manufacture refuse disposal machinery, power pumping plants and kindred equipment. Application for a State charter will be made at an early date. A. L. Petty, 1156 Frick Annex, heads the company.

The Andrews Dental Casting Machine Co., Pittsburgh, is being organized by Alexander P. Lindsay, 1267 Frick Annex, and Joseph F. Weis, and Walter W. Reihl, to manufacture precision machinery and tools for dental service. Application for a State charter will be made on Feb. 28.

The United Engineering & Foundry Co., Farmers' Bank Building, Pittsburgh, manufacturer of iron and steel forgings, machinery, etc., has closed its plant on Oak Street, Youngstown, Ohio, permanently and will remove the works to its Kneeland plant at Pittsburgh.

The Sweetbriar Laboratories, Pittsburgh, are being organized by William A. Wilson, Grayson M. Metz and Frank S. Delp, to manufacture intensifying screens, X-ray laboratory equipment and precision apparatus. Calvert, Thompson & Wilson, 1737 Oliver Building, represent the company. Application for a State charter will be made on March 8.

The Crane Co., South Michigan Avenue, Chicago, manufacturer of valves, fittings, etc., has plans under way for a new two and three-story machine and repair works on property recently acquired on Twenty-fourth Street, Pittsburgh. A new six-story warehouse building, 72 x 90 ft., will also be erected. The structures are estimated to cost about $500,000, with equipment. The Hunting-Davis Co., Century Building, Pittsburgh, are architects.

The Sheet Metal Mfg. Co., Chestnut Street, Youngstown, Ohio, is having plans prepared for the erection of a new one-story building, 100 x 200 ft., on West Federal Street, to cost about $30,000.

The Coalton Coal Corporation, Christianburg, Va., recently organized, is planning for the installation of an aerial tramway at its coal properties, Williamson, W. Va., in connection with the installation of new mining machinery, including mine cars, etc. J. T. Jones, Cambria, Va., is secretary and treasurer.

The Ridenour-Turner Co., Clarksburg, W. Va., has been incorporated with a capital of $50,000 by N. C. and Paul Ridenour, Newburg, W. Va., and J. Russell Summers, Clarksburg, to manufacture automobile parts and equipment.

The Eureka Specialty Mfg. Co., Wheeling, W. Va., has

been incorporated with a capital of $50,000, by W. M. Gallagher, D. T. Haudenschield and C. S. Keedy, to manufacture labor saving equipment, machinery, etc.

The International Nickel Co., 43 Exchange Place, New York, will soon break ground for its new plant at Huntington, W. Va., for the manufacture of rolled nickel and affiliated products, estimated to cost in excess of $1,000,000 with machinery. W. D. Witherspoon is consulting engineer.

The Twelfth Street Garage Co., Wheeling, W. Va., has plans under way for the construction of a new five-story brick and reinforced-concrete service building and machine repair works, 82 x 125 ft., at Twelfth and Main streets, to cost about $150,000, with equipment. C. W. Bates, 77 Fourteenth Street, is architect.

The Mine Safety Appliance Co., Pittsburgh, has filed plans for a new one-story building at 7521-23 Meade Street, to cost about $14,000.

The Carlem Engineering Co., Brightwood, Pa., has been incorporated with a capital of $25,000 to manufacture mechanical specialties. Frederick Kubitz, Brightwood, is treasurer.

The Gulf States

BIRMINGHAM, Feb. 21.

The Magnolia Petroleum Co., Dallas, Tex., has plans under way for a new oil refinery at Port Neches, Tex., where a 600-acre site has been acquired.

The Union Power Co., Shreveport, La., recently organized with a capital of $3,000,000 has plans under way for a number of electric generating plants in the Monroe, La., gas fields. Officials of the Frost-Johnson Lumber Co., Shreveport, head the company.

The Arkansas-Texas Oil Co., Hope, Ark., is planning for the construction of a new oil refinery. W. T. Knight is president.

The Gravity Canal Co., Alexandria, La., is planning for the construction of a hydroelectric power plant in the Bayou Cocodrie district. Application for permission has been made to the Federal Power Commission, Washington.

The Hill-Sutton Co., El Paso, Tex., manufacturer of metal products, is planning for a new one-story factory, 85 x 150 ft., estimated to cost about $25,000.

The Austin Machinery Co., 1020 Maison Blanche Building, New Orleans, La., has been organized with a capital of $300,000 to manufacture contractors' and road machinery.

The Union Gin Co., Yorktown, Tex., is planning for the installation of new machinery at its plant to cost about $20,000.

The International Fiber Co., 610 Staples Building, El Paso, Tex., recently organized with a capital of $500,000, has secured a local building for its new works. A machine shop department will be included. W. J. Rand is president.

The Jenkins Brick Co., Montgomery, Ala., is planning for the installation of new pulverizing and other machinery at its plant.

The Standard Oil Co., Shreveport, La., is arranging for the erection of a new machine shop on Greenwood Road, in connection with the establishment of a warehouse at this location. The structures will cost about $100,000.

The Builders' Products Co., Lake Charles, La., has plans under way for a new plant to manufacture hollow tile, paving blocks, brick, etc. A machinery list will be prepared at an early date. Samuel Cummings is president and manager.

The Gournay Motor Co., Eunice, La., has been incorporated with a capital of $100,000 by S. A. and C. A. Gournay, to manufacture automobile parts and motor equipment.

The Board of Prison Directors, Montgomery, Ala., is having plans prepared for a new machine shop at the State penitentiary. Martin J. Lide & Co., Birmingham, are architects and engineers.

Detroit

DETROIT, Feb. 21.

The local machine tool market remains exceedingly quiet, although there continues to be an increase in inquiries, with the prospect that orders will be placed in the near future. The betterment in the automotive situation, although slow, is the chief factor in causing optimism.

The Triangle Truck Co., St. Johns, Mich., has received an order for 3,750 trucks from the Attick-Shoecraft Co., Kansas City, and also substantial increases in shipping schedules from dealers and distributors. It is stated the company will be forced to take on additional men and make an addition to its plant and equipment.

The Belle Isle Boat & Engine Co., Detroit, will erect in the near future a one-story addition, 90 x 150 ft.

The Wheel Truing Brake Co., Detroit, will soon erect a factory and office building, two stories, 50 x 80 ft., at an estimated cost of $30,000.

The American Stamping Co., Battle Creek, Mich., which has plans for an addition to double its production, states that ground will be broken as soon as weather permits. The building will be two stories, 100 x 215 ft.

The Michigan Stamping Co., Mack Avenue, Detroit, is having revised plans prepared for its one-story addition. E. F. Tant is secretary.

William Christian, 172 Connecticut Avenue, Detroit, and associates have organized the Superior Stove & Stamping Co., to manufacture stoves and furnaces, castings, stampings, etc.

The Presto Engineering Co., 31 East Woodbridge Street, Detroit, is planning for the installation of new machine shop equipment.

The Transue & Williams Co., Alliance, Ohio, has preliminary plans under way for its new plant on site recently acquired at Marysville, Mich., to cost about $40,000. R. H. Gordon, Marysville, is engineer. The company specializes in the manfacture of automobile axles, steel forgings, etc.

Richard Allingham, Hudson City, Mich., and associates have organized the South Michigan Brass Foundry to manufacture brass, bronze and other metal castings.

P. M. Hutchings, Ionia Avenue, Northwest, Grand Rapids, Mich., is having plans prepared by Robinson & Campau, Houseman Buildng, for a new four-story motor service building and repair works, 100 x 125 ft., to cost about $200,000 with equipment.

The Detroit Radio Laboratories, Inc., Detroit, has been incorporated with a capital of $50,000 by Arthur L. Smith, E. B. and Irvin G. Dietterich, 3663 Pulford Avenue, to manufacture wireless equipment for telephone and telegraph service.

The Illinois Tool Co., Marysville, Mich., has awarded contracts to the Wallbridge-Adinger Co., 2356 Penobscot Building, Detroit, for a new two unit plant, each unit to be one-story, the total works to aggregate 400 x 1200 ft. The cost is estimated at $100,000. T. E. Clark is head.

Baltimore

BALTIMORE, Feb. 21.

The American Tool & Machine Co., Baltimore, has taken title to property on Bel Air Avenue, near Southern Street, heretofore held by the National Engineering & Electric Co., as a site for a new plant. The purchasing company was formerly known as the Oriole Specialty Corporation, recently effecting the change in name.

Freight handling and conveying machinery, cranes, etc., will be installed at the new marine terminal to be constructed at Wilmington, Del., by the Board of Harbor Commissioners. An appropriation of $1,750,000 has been arranged and plans and specifications are expected to be ready for bids at an early date. The duPont Engineering Co., Wilmington, is engineer.

The Maryland Concrete Corporation, 700 Equitable Building, Baltimore, has acquired the plant and business of the Maryland Concrete Products Corporation, Lansdowne, Md., and will erect an addition, 60 x 100 ft., on property adjoining.

The United Cigarette Machine Co., Lynchburg, Va., has filed plans for a two-story addition, 52 x 145 ft., to cost about $45,000.

The A. J. Evans Hardware Co., Lynchburg, Va., has been incorporated with a capital of $25,000 by A. J. Evans, Sr. and Jr., to manufacture hardware specialties and other metal products.

A. J. Johnson and J. L. Pritchett, Columbus, Ga., are organizing a company to establish a plant for the manufacture of textile equipment for cotton mills.

The Refractory Products Co., Wilmont, Va., recently organized with a capital of $900,000, is planning to establish a local plant for the manufacture of fire brick, refractory linings, and kindred specialties.

The Carter Type Machine Co., Industrial Building, Baltimore, recently organized to manufacture type-casting machines and parts, has preliminary plans under way for a new one-story plant, 75 x 150 ft. Bids for the construction will soon be asked. Nathaniel Keen is president.

The Southern Ice Machine Co., Charlotte, N. C., will build an addition, 75 x 140 ft. F. A. Owens is manager.

The Charles L. Stockhausen Co., 315 North Howard Street, Baltimore, builder and contractor, has acquired the plant of the General Shipbuilding Corporation, Alexandria, Va., for $50,600, and is said to be planning to operate the

works as a shipyard with department for the manufacture of iron and steel products in connection with its regular operations.

The Atlas Wheelbarrow & Truck Co., Easton, Md., recently organized, has acquired a foundry on South Washington Street, with adjoining property, as a site for its new plant. The present structure will be remodeled and improved and a new factory built. The company will take over the local business of the same character heretofore operated by James C. Mullikin and Edwin J. Biery, who are interested in the new organization. John E. Auld, Jr., 1805 Clifton Avenue, Baltimore, heads the new company.

The American Engineering Co., Norfolk, Va., recently organized with a capital of $50,000, will take over the plant and business of the Crescent Iron Works, Norfolk. It is said that the new company plans extensions and improvements. J. J. Fields is head.

Cleveland

CLEVELAND, Feb. 21.

The market continues dull with orders limited to single machines. The volume of business, however, shows a little increase compared with January. Manufacturers of screw machines have received a few orders for single tools and a local maker of forging machinery has just booked two large machines. Some of the inquiries that came out late last year have not yet resulted in orders. It is understood that the National Lamp Works of the General Electric Co., which issued a large list several weeks ago, has postponed buying until July. A few manufacturing plants in this section have increased operations slightly and report an improved outlook. Some increased activity is due to the release of orders from automobile companies. However, local foundry operations have fallen off slightly. Late reports from 23 gray iron, steel and malleable foundries in Cleveland show operations at an average of 24 per cent of capacity, compared with 28 per cent a month ago. No further price reductions are noted.

The Western Reserve Foundry Co., Cleveland, recently organized, has leased the former Fulton foundry on Marquette Avenue, near St. Clair Avenue.

The Bevington Metal Stamping Co., Cleveland, has been incorporated with a capital stock of $25,000 and has established a plant at 1545 East Eighteenth Street for the manufacture of small stampings, dies, tools and special machinery, including a wire-straightening machine. It has taken over the business formerly conducted in the name of J. E. Bevington. Mr. Bevington is president, and C. L. Cox, secretary and treasurer.

The Modern Engineering Co., Toledo, Ohio, recently incorporated to take over the business of the Modern Machine & Tool Co., 831 Ash Street, has elected Carl Eyers, president; Albert J. Bellg, vice-president and general manager, and Henry J. Higgins, assistant general manager.

The Hertner Electric Co., 1900 West 112th Street, Cleveland, is having plans prepared for a one-story factory and warehouse, 50 x 250 ft., on Berea Road.

Milwaukee

MILWAUKEE, Feb. 21.

The apathetic attitude of machine tool buyers seems to be gradually undergoing a change to one of interest, as manifested in increasing inquiries and orders. Business continues of restricted volume, however, and is confined to single tool purchases from widely scattered sources. It is apparent that purchases are made only upon necessity. One outstanding feature is that transactions depend largely on prices. The insistence of buyers on reductions is being reflected in the attitude that nothing can be lost but much may be gained by waiting for further developments.

Steel founders are experiencing a lessening of orders and in the last two weeks production has shown some restriction. On the other hand, gray and malleable iron founders have been able to resume or to make some slight increases in output although advance orders are within close limits.

The Hayton Pump & Blower Co., Appleton, Wis., is in the market for a miscellaneous lot of machine shop tools and other equipment to effect an increase of 35 to 40 per cent in its capacity. It manufactures triplex pumping engines, blowers, and similar equipment and has orders which will keep the works busy until after July 1.

The Wisconsin Ice & Coal Co., 216 West Water Street, Milwaukee, has plans by C. F. Ringer & Son, architects, for a brick and steel building, 120 x 134 ft., part two stories, for the production of artificial ice and for storage. It will be situated at Cambridge Avenue and Thomas Street and cost about $125,000. John H. Kopmeier is president.

Fairbanks, Morse & Co., Chicago, will proceed with the erection and equipping of a gray iron foundry costing $500,000 at its Eclipse works in Beloit, Wis. It is stated that the plant has temporarily suspended operations because of the accumulation of finished product. The foundry is about 65 per cent completed.

The Acme Body Works, Appleton, Wis., established about two years ago to manufacture automobile and motor truck bodies, etc., has incorporated its business without change of style. The capital stock is $60,000. The incorporators are C. C. Seeger and George W. Wiegand, the principal owners.

The Board of Education, Munising, Mich., has awarded the general contract to the Foster Construction Co., Caswell Block, Milwaukee, for the construction of a new $300,000 high school, designed also for vocational training. The architect is John D. Chubb, 109 North Dearborn Street, Chicago. F. W. Scholtis is secretary of the board.

The Viroqua Crystal Ice Co., Viroqua, Wis., has been incorporated to built an artificial ice plant. The capital stock is $25,000 and the incorporators are C. W. Graves, I. E. Stoll and W. F. Lindemann.

The Re-Flow System of Wisconsin, Milwaukee, has been chartered to manufacture auxiliary carburetion devices for internal combustion engines and other accessories and supplies for the automotive industries generally. The capital stock is $75,000 and the incorporators are C. W. Hasler, John E. Nelson and Lyyn S. Pease, attorney, 221 Grand Avenue, Milwaukee.

The Trempealeau County Board of Supervisors, Whitehall, Wis., has commissioned A. D. Conover, architect and engineer, Tenney Block, Madison, Wis., to design a boiler and engine house, 44 x 70 ft., costing about $25,000, for the county asylum group. Bids will be taken until March 11.

The Milwaukee Marine Repair Co., Milwaukee, has been incorporated with a capital stock of $25,000 to engage in marine engineering, specializing in repair work on Great Lakes vessels. The incorporators are Thomas Kotting, W. A. Roundy and Joseph J. Cato, 573 American Avenue.

The Central South

ST. LOUIS, Feb. 20.

The Chester Iron & Foundry Co., 700 Vulcan Street, St. Louis, has taken bids for its new one-story foundry, 50 x 100 ft., to cost about $30,000. E. A. Linnis is secretary.

Warring & Co., Henryetta, Okla., have awarded a contract to J. & H. Bryant, Henryetta, for a new one-story machine shop, 40 x 150 ft., to cost $22,000.

The Dempster Steam Motor Co., Knoxville, Tenn., recently organized with a capital of $1,000,000 to manufacture mine locomotives and other steam-driven equipment, is arranging a list of machine tools and other equipment for its new plant. R. S. Dysart, Dempster Building, is general manager.

The Madisonville Drain Tile Co., Madisonville, Ky., is having plans prepared for a new one-story plant, 25 x 105 ft. Bids on equipment are being asked. J. D. Bobbitt is secretary and treasurer.

The Ideal Tractor Cultivator Co., McCall Building, Memphis, Tenn., manufacturer of motor tractors and agricultural machinery, has acquired a local building, to be remodeled and extended for a new plant. R. F. Carr is president.

The St. Louis Screw Co., 600 Clarence Avenue, St. Louis, manufacturer of bolts, nuts, bar iron, screws, etc., has awarded a contract to the Decatur Bridge Co., East Eldorado Street, Decatur, Ill., for its new one-story plant on Prescott Street, 163 x 185 ft., to cost about $40,000. It has plans under way for a two-story building, 140 x 450 ft., on North Broadway, and estimated to cost approximately $100,000. Bids for erection will soon be asked.

The Mid-State Battery Mfg. Co., 615 West Grand Street, Oklahoma City, Okla., recently organized, is planning for the establishment of a local plant for the manufacture of storage batteries and kindred products. M. J. O'Connor is president.

The Kingsbury Garage Co., Arcade Building, St. Louis, will take bids early in April for a new one-story service building and repair works, 113 x 115 ft., at Kings Highway and De Baliviere Avenue, to cost about $125,000. N. B. Howard, Arcade Building, is architect.

Freight handling and conveying machinery, hoisting equipment, etc., will be installed by the Board of Transportation Trustees, Nashville, Tenn., at the new rail and river terminal building to be constructed on the waterfront, near Broadway. It will be five-stories, 140 x 300 ft., and is estimated to cost about $300,000. Freeland, Roberts and Akers, Nashville, are consulting engineers.

The machine shop section of the Missouri Pacific Railroad shops at St. Louis, was destroyed by fire on Feb. 16. The building was a two-stories structure, 75 x 150 ft. The damage is estimated at $100,000.

Indiana

INDIANAPOLIS, Feb. 21.

The City Council, Richmond, Ind., has completed plans for its proposed municipal electric light and power plant, estimated to cost about $175,000 with machinery. J. D. Lyon, Union Central Building, Cincinnati, is engineer.

An electric power plant will be constructed by the Farmers' Co-Operative Packing Co., Delphi, Ind., in connection with new packing works, to cost about $500,000.

The Adjustable Bearing Co., Terre Haute, Ind., has been incorporated with a capital of $25,000 by C. A. and Z. M. Maris, and A. D. Miller, Terre Haute, to manufacture ball and roller bearings, etc.

The Indianapolis Refrigerating Co., 232 South Pennsylvania Avenue, Indianapolis, is planning for extensions and improvements in its one-story plant to cost about $50,000, including equipment.

The Paoli Water & Light Co., Paoli, Ind., has been incorporated with $75,000 capital stock. The directors are Raymond Stout, C. C. Johnson and R. M. Cass.

California

LOS ANGELES, Feb. 15.

The All-In-One Co., 231 Ochsner Building, Sacramento, Cal., manufacturer of iron-enameled products, is having plans prepared for a new plant on Slauson Avenue, Los Angeles, consisting of two buildings, two and three-stories, 200 x 410 ft., and 200 x 250 ft. It will cost in excess of $75,000 and it is proposed to break ground some time in March.

The Love & Deuter Machine Works, 3030 South Main Street, Los Angeles, have filed notice of organization to manufacture machinery and parts. H. L. Love, 439 East Twenty-ninth Street, and E. C. Deuter, 1401 Orchard Avenue, head the company.

The Advance Truck Co., Los Angeles, manufacturer of trucks and parts, is having plans prepared for a new two-story, reinforced-concrete factory, 100 x 150 ft., at Yale and Alpine streets. Benjamin J. Bloser, 523 Consolidated Realty Building, is architect.

The McKnight Fire Brick Co., Porterville, Cal., has been merged with the Craycroft Brick Co., Fresno, Cal. The Porterville works will be removed to Fresno, where extensions will be made in the Craycroft works for the manufacture of fire brick and other refractory products. William Turner will be plant superintendent.

The Lincoln Heights Sheet Metal Works, 119 North Daly Street, has filed notice of organization to manufacture iron and other metal products. Oscar H. Haller, 1725 Mt. Royal Avenue, heads the company.

Harry W. Lobb and John W. Fraser, Francisco, have organized a company with capital of $400,000 to build a factory at Porterville, Cal., for the manufacture of brick and tile. A site has been secured and plans are under way. A machinery list is being arranged.

The La Electric & Fixture Works, 1910 South Main Street, Los Angeles, has filed notice of organization to manufacture electric fixtures and other metallic products. Capitola La Touche, 2006 South Union Avenue, heads the company.

Roemer, Roemer & Silva, Santa Maria, Cal., have awarded contract to O. C. Marriott & Co., Santa Maria, for a new one-story automobile machine and repair works, 140 x 144 ft., at Broadway and Mill Street, to replace their shop recently destroyed by fire. With machinery, it will cost about $50,000.

Canada

TORONTO, Feb. 21.

The demand for machine tools in this market, while still much below normal is gradually increasing. Inquiries also are more numerous than for several weeks, but are mostly for single machines. The Canadian National Railways have specifications out for about $5,000 worth of tools, chiefly high speed drills for its Moncton, N. B., shops. Second-hand and rebuilt machinery is more active.

The erection of an iron foundry is contemplated by the H. Mueller Mfg. Co., Clifford Street, Sarnia, Ont. C. H. Heiby, 280 Wellington Street, is manager.

J. J. O'Sullivan, chief engineer, is revising plans for a pulp mill to cost $1,500,000 for the Three Rivers Pulp & Paper Co., Ltd., 511 St. Catharine Street, West, Montreal. It will be erected at Three Rivers, Que.

E. Batisti, 140 McEwan Avenue, Windsor, Ont., will build a sheet metal shop.

J. Walker, 151 Strathcona Avenue, Ottawa, Ont., has the general contract for the erection of a repair shop for the Pease Foundry Co., 285 Lyon Street, Ottawa.

Plans are being prepared for airplane hangars and a machine shop to cost $75,000 for the Dominion Government Militia Department, Ottawa, Ont., to be erected at Vancouver, B. C. Bids will be called in the near future. Major McLaurin, Hotel Vancouver, Vancouver, B. C., is superintendent of Jericho Station.

The Dominion Engineering & Construction Co. has been organized for the manufacture of machinery and pumps. A plant has been established in Longueuil, across the river from Montreal, and machinery is now being installed.

The Monarch Industries, Ltd., Beamsville, Ont., has been incorporated with a capital stock of $300,000 by Arthur E. Field-Marshall, Charles T. Connor, James A. Hewett and others to manufacture registers, carburetors, motors, etc.

The Ellis-McIntyre Motors, Ltd., Hamilton, Ont., has been incorporated with a capital stock of $150,000 by Daniel L. McIntyre, Willoughby Ellis, Charles E. Sellens and others to manufacture automobiles, trucks, tractors, etc.

The Eagle foundry, formerly operated by John Smith & Sons, St. John, N. B., has been taken over by M. Harrigan and Frank Howard, who are operating the plant under the name of the Courtney Bay Iron & Brass Works.

Government Purchases

WASHINGTON, Feb. 21.

Bids are being accepted by the Bureau of Supplies and Accounts, Navy Department, Washington, for the following: Schedule 7383, one hoisting engine for Mare Island, opening March 18; schedule 7466, 889 pneumatic rivet sets for various Eastern and Western yards, opening March 18; schedule 7586, a single drum hoist for Puget Sound, opening March 11; schedule 7610, a miscellaneous quantity of ammeters for Philadelphia, opening March 11.

Trade Changes

The Locomotive Superheater Co., 30 Church Street, New York, has taken over the patents and the business of the Locomotive Feed Water Heater Co., same address. The Locomotive Superheater Co. will conduct the further application of the apparatus for preheating feed water through its regular organization, to which has been added the operating organization of the Locomotive Feed Water Heater Co. It is expected that this consolidation will result in intensified development and better service.

Horace H. Lane, H. Daziel Davenport and A. A. Peterson have formed a partnership to engage in a general architectural and engineering practice with offices at 2320 Dime Bank Building, Detroit. Mr. Lane began as a machinist's apprentice with the Cambria Iron Co., Johnstown, Pa. He has had charge of the construction of plants and power houses for such concerns as the American Car & Foundry Co., the Eastern Car Co. and Haskell & Barker Car Co. During the war he built shipbuilding plants, such as the Detroit Shipbuilding Co. and the Davie Shipbuilding Co., Quebec. Mr. Davenport was graduated in architecture from the University of Michigan and completed his training in Europe. He has been practicing for several years in Grand Rapids and Detroit. Mr. Peterson is a structural engineer with several years experience in the structural design of steel and reinforced concrete buildings. He was graduated from Purdue University and has been associated with Mr. Lane in the design and layout of manufacturing buildings for the past nine years.

The D. Souter Mfg. Co., Inc., Baton Rouge, La., has been organized and will place its work on contract with different manufacturers. The company will build novelty machine works and offices in the near future. It will place on the market Souters pipe couplings, with patents pending on pipe flanges, flange pipe couplings, flange unions for high pressure oil and gas pipe lines, fire hose holders, fire hose conveyors, line hose and pike pole holders and other improved metal products. The company will offer for sale the U. S. Patent Rights on these patented improvements. The officers are D. Souter, president; Mark H. Souter, vice-president, and Fred D. Conrad, secretary-treasurer.

The Hazard Mfg. Co., Wilkes-Barre, Pa., manufacturer of wire rope and electrical wires and cables, on Feb. 1 opened a new sales office and warehouse at 1701-1703 First Avenue, Birmingham, Ala., in charge of R. J. Bravand, district manager. Mr. Bravand's connection with the company covers a period of 22 years, partly at the plant and partly in the field. Of recent years he has been service engineer, and in that capacity made an intensive study of wire rope engineering as applied particularly to mine hoisting and haulage.

Current Metal Prices

On Small Lots, Delivered from Merchants' Stocks, New York City

The quotations given below are for small lots, as sold from stores in New York City by merchants carrying stocks.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipment in carload lots from mills, these prices are given for their convenience.

On a number of articles the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE under the general heading of "Iron and Steel Markets" and "Metal Markets."

Iron and Soft Steel Bars and Shapes

Bars:	Per Lb.
Refined bars, base price	3.58c. to 3.63c.
Swedish bars, base price	15.00c.
Soft steel bars, base price	3.58c. to 3.63c.
Hoops, base price	4.33c. to 4.58c.
Bands, base price	4.28c. to 4.33c.
Beams and channels, angles and tees 3 in. x ¼ in. and larger, base	3.68c. to 3.73c.
Channels, angles and tees under 3 in. x ¼ in., base	3.59c. to 3.63c.

Merchant Steel

	Per Lb.
Tire, 1½ x ½ in. and larger	3.65c.
(Smooth finish, 1 to 2½ x ¼ in. and larger)	3.85c.
Toe calk, ½ x ⅜ in. and larger	4.25c.
Cold-rolled strip, soft and quarter hard	10.00c. to 10.50c.
Open-hearth spring steel	4.70c. to 8.00c.
Shafting and Screw Stock:	
Rounds	5.50c.
Squares, flats and hex	6.00c.
Standard cast steel, base price	15.00c.
Best cast steel	20.00c.
Extra best cast steel	25.00c.

Tank Plates—Steel

¼ in. and heavier ..... 3.88c. to 3.93c.

Sheets

Blue Annealed

	Per Lb.
No. 10	4.50c. to 4.83c.
No. 12	4.55c. to 4.88c.
No. 14	4.60c. to 4.93c.
No. 16	4.70c. to 5.03c.

Box Annealed—Black

	Soft Steel C.R., One Pass Per Lb.	Wood's Refined, Per Lb.
Nos. 18 to 20	5.30c. to 5.68c.	.....
Nos. 22 and 24	5.35c. to 5.73c.	6.80c.
No. 26	5.40c. to 5.78c.	6.90c.
No. 28	5.50c. to 5.88c.	7.00c.
No. 30	5.75c. to 6.13c.	.....

No. 28, 36 in. wide, 10c. higher.

Galvanized

	Per Lb.
No. 14	5.25c. to 6.23c.
No. 16	5.50c. to 6.48c.
Nos. 18 and 20	5.65c. to 6.63c.
Nos. 22 and 24	5.80c. to 6.78c.
No. 26	5.95c. to 6.93c.
No. 27	6.10c. to 7.08c.
No. 28	6.25c. to 7.23c.
No. 30	6.75c. to 7.73c.

No. 28, 36 in. wide, 20c. higher.

Welded Pipe

Standard Steel	Blk.	Galv.	*Wrought Iron*	Blk.	Galv.
½ in. Butt...	—40	—23	¾-1½ in. Butt.	— 3	+17
¾-3 in. Butt.	—44	—28	2 in. Lap.....	+ 3	+21
3½-6 in. Lap.	—39	—24	2½-6 in. Lap...	+ 1	+17
7-12 in. Lap..	—32	—15	7-12 in. Lap....	+12	+30

Steel Wire

BASED PRICE* ON NO. 9 GAGE AND COARSER	Per Lb.
Bright basic	5.75c.
Annealed soft	5.75c.
Galvanized annealed	6.50c.
Coppered basic	6.25c.
Tinned soft Bessemer	7.25c.

*Regular extras for lighter gages.

Brass Sheet, Rod, Tube and Wire

BASE PRICE

High brass sheet	20 c. to 22½c.
High brass wire	21 c. to 23½c.
Brass rod	16¾c. to 22½c.
Brass tube	33¾c. to 37½c.

Copper Sheets

Sheet copper, hot rolled, 24 oz., 23c. to 24c. per lb. base.

Cold rolled, 14 oz. and heavier, 2c. per lb. advance over hot rolled.

Tin Plates

Bright Tin		Coke—14x20		
			Primes	Wasters
Grade "AAA" Charcoal 14x20	Grade "A" Charcoal 14x20	80 lb....	$7.80	$7.55
		90 lb....	7.90	7.65
		100 lb....	8.00	7.75
IC.. $12.00	$10.75	IC....	8.15	7.90
IX.. 13.75	12.25	IX....	9.15	8.90
IXX.. 15.25	13.75	IXX....	10.15	9.90
IXXX.. 16.50	15.08	IXXX....	11.15	10.90
IXXXX.. 18.00	16.25	IXXXX....	12.15	11.90

Terne Plates

8-lb. Coating 14 x 20

100 lb.	$8.35
IC	8.50
IX	9.50
Fire door stock	11.50

Tin

Straits pig	36c.
Bar	41c. to 46c.

Copper

Lake ingot	16c.
Electrolytic	16c.
Casting	16c.

Spelter and Sheet Zinc

Western spelter	7¼c. to 7¾c.
Sheet zinc, No. 9 base, casks	13½c. open 14c.

Lead and Solder*

American pig lead	5¾c. to 6¾c.
Bar lead	6¾c. to 7½c.
Solder, ½ and ½ guaranteed	25c.
No. 1 solder	22½c.
Refined solder	18½c.

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb	80c.
Commercial grade, per lb	40c.

Antimony

Asiatic ..... 7½c. to 8½c.

Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb.... 35c to 38c.

Old Metals

Business is very dull but values show little change. Dealers' buying prices are nominally as follows:

	Cents Per Lb.
Copper, heavy and crucible	10.75
Copper, heavy and wire	10.00
Copper, light and bottoms	8.00
Brass, heavy	6.50
Brass, light	5.00
Heavy machine composition	10.25
No. 1 yellow brass turnings	5.75
No. 1 red brass or composition turnings	8.25
Lead, heavy	3.50
Lead, tea	2.25
Zinc	2.75